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PORTLAND CEMENT SPECIFICATIONS

Adopted as the Standard for Use by All Departments, Bureaus and Offices of the United States Government—Endorsed by Technical Societies on all but Two Points

A NEW set of specifications for Portland cement has just been issued, which it seems probable will take the place of those of the American Society of Civil Engineers and the American Society for Testing Materials, since all the departments, bureaus and offices of the United States government are required to use them in all government work. The steps leading to the adoption of these were described in our issue of February 1, 1912, and in publishing these specifications S. W. Stratton, director of the Bureau of Standards, states that in preparing them "substantial agreement was reached" (by the government and the several technical societies and manufacturers conferring) "on practically all points except the methods of determining the normal consistency and time of setting." These specifications were adopted by the conference of the governmental departments in February and on April 30 were ordered by the President to be used in all departments. The general specifications are as follows:

1. *Definition.*—The cement shall be the product obtained by finely pulverizing clinker produced by calcining to incipient fusion, an intimate mixture of properly proportioned argillaceous and calcareous substances, with only such additions subsequent to calcining as may be necessary to control certain properties. Such additions shall not exceed 3 per cent., by weight, of the calcined product.

2. *Composition.*—In the finished cement, the following limits shall not be exceeded:

	Per cent.
Loss on ignition for 15 minutes.....	4
Insoluble residue.....	1
Sulphuric anhydride (SO ₃).....	1.75
Magnesia (MgO).....	4

3. *Specific Gravity.*—The specific gravity of the cement shall be not less than 3.10. Should the cement as received fall below this requirement, a second test may be made upon a sample heated for 30 minutes at a very dull red heat.

4. *Fineness.*—Ninety-two per cent. of the cement, by weight, shall pass through the No. 100 sieve, and 75 per cent. shall pass through the No. 200 sieve.

5. *Soundness.*—Pats of neat cement prepared and treated as hereinafter prescribed shall remain firm and hard and show no sign of distortion, checking, cracking, or disintegrating. If the cement fails to meet the prescribed steaming test, the cement may be rejected or the steaming test repeated after seven or more days at the option of the engineer.

6. *Time of Setting.*—The cement shall not acquire its initial set in less than 45 minutes and must have acquired its final set within 10 hours.

7. *Tensile Strength.*—Briquettes made of neat cement, after being kept in moist air for 24 hours and the rest of the time in water, shall develop tensile strength per square inch as follows:

	Pounds.
After 7 days.....	500
After 28 days.....	600

8. Briquettes made up of 1 part cement and 3 parts standard Ottawa sand, by weight, shall develop tensile strength per square inch as follows:

	Pounds.
After 7 days.....	200
After 28 days.....	275

9. The average of the tensile strengths developed at each age by the briquettes in any set made from one sample is to be considered the strength of the sample at that age, excluding any results that are manifestly faulty.

10. The average strength of the sand mortar briquettes at 28 days shall show an increase over the average strength at 7 days.

11. *Brand.*—Bids for furnishing cement or for doing work in which cement is to be used shall state the brand of cement proposed to be furnished and the mill at which made. The right is reserved to reject any cement which has not established itself as a high-grade Portland cement, and has not been made by the same mill for two years and given satisfaction in use for at least one year under climatic and other conditions at least equal in severity to those of the work proposed.

12. *Packages.*—The cement shall be delivered in sacks, barrels, or other suitable packages (to be specified by the engineer), and shall be dry and free from lumps. Each package shall be plainly labeled with the name of the brand and of the manufacturer.

13. A sack of cement shall contain 94 pounds net. A barrel shall contain 376 pounds net. Any package that is short weight or broken or that contains damaged cement may be rejected, or accepted as a fractional package, at the option of the engineer.

14. *Inspection.*—The cement shall be tested in accordance with the standard methods hereinafter prescribed. In general the cement will be inspected and tested after delivery, but partial or complete inspection at the mill may be called for in the specifications or contract. Tests may be made to determine the chemical composition, specific gravity, fineness, soundness, time of setting, and tensile strength, and a cement may be rejected in case it fails to meet any of the specified requirements. An agent of the contractor may be present at the making of the tests or they may be repeated in his presence.

15. In case of the failure of any of the tests, and if the contractor so desires, the engineer may, if he deem it to the interest of the United States, have any or all of the tests made or repeated by the Bureau of Standards, United States Department of Commerce and Labor, in the manner hereinafter specified, all expense of such tests to be paid by the contractor. All such tests shall be made on samples furnished by the engineer.

STANDARD METHODS OF TESTING.

16. *Sampling.*—The selection of the samples for testing will be left to the engineer. The number of packages sampled and the quantity to be taken from each package will depend on the importance of the work, the number of tests to be made, and the facilities for making them.

17. The samples should be so taken as to represent fairly the material, and, where conditions permit, at least 1 barrel in every 50 should be sampled. Before tests are made samples shall be passed through a sieve having 20 meshes per linear inch to remove foreign material. Samples shall be tested separately for physical qualities, but for chemical analysis mixed samples may be used. Every sample should be tested for soundness, but the number of tests for other qualities will be left to the discretion of the engineer.

18. *Chemical Analysis.*—The method to be followed for the analysis of cement shall be that proposed by the Committee on Uniformity in the Analysis of Materials for the Portland Cement Industry, reported in the *Journal of the Society for Chemical Industry*, volume 21, page 12, 1902, and published in *Engineering News*, volume 50, page 60, 1903, and in the *Engineering Record*, volume 48, page 49, 1903.

19. The insoluble residue shall be determined on a 1-gram sample, which is digested on the steam bath in hydrochloric

acid of approximately 1.035 specific gravity until the cement is dissolved. The residue is filtered, washed with hot water, and the filter-paper contents digested on the steam bath in a 5-per cent. solution of sodium carbonate. The residue is then filtered, washed with hot water, then with hot hydrochloric acid, approximately of 1.035 specific gravity, and finally with hot water, then ignited and weighed. The quantity so obtained is the insoluble residue.

20. *Determination of Specific Gravity.*—The determination of specific gravity may be made with a standardized apparatus of Le Chatelier or other equally accurate form. Benzine (62° Baumé naphtha), or kerosene free from water, should be used in making the determination. The cement should be allowed to pass slowly into the liquid of the volumometer, taking care that the powder does not adhere to the side of the graduated tube above the liquid and that the funnel through which it is introduced does not touch the liquid. The temperature of the liquid in the flask should not vary more than 1° F. during the operation. To this end the flask should be immersed in water. The results of repeated tests should agree within 0.01.

21. If the specific gravity of the cement as received is less than 3.10, a redetermination may be made as follows:

Seventy grams of the cement is placed in a nickel or platinum crucible about 2 inches in diameter and heated for 30 minutes at a temperature between 419° C and 630° C. After the cement has cooled to atmospheric temperature the specific gravity shall be determined in the same manner as described above. The cement should be heated in a muffle or other suitable furnace, the temperature of which is to be maintained above the melting point of zinc (419° C) but below the melting point of antimony (630° C). This maximum temperature can be recognized as a very dull red which is just discernible in the dark.

22. *Determination of Fineness.*—The No. 100 and No. 200 sieves shall conform to the standard sieve specifications of the Bureau of Standards, Department of Commerce and Labor.

23. The determination of fineness should be made on a 50-gram sample, which may be dried at a temperature of 100° C (212° F) prior to sifting. The coarsely screened sample should be weighed and placed on the No. 200 sieve, which, with the pan and cover attached should be held in one hand in a slightly inclined position and moved forward and backward in the plane of inclination, at the same time striking the side gently about 200 times per minute against the palm of the other hand on the upstroke. The operation is to be continued until not more than 0.05 grams will pass through in one minute. The residue should be weighed, then placed on the No. 100 sieve, and the operation repeated. The sieves should be thoroughly dry and clean. Determination of fineness may be made by washing the cement through the sieve or by a mechanical sifting device which has been previously standardized with the results obtained by hand sifting on equivalent samples. In case of the failure of the cement to pass the fineness requirements by the washing method or the mechanical device, it shall be tested by hand.

24. *Mixing Cement Pastes and Mortars.*—The quantity of cement and sand to be used in the paste or mortar should be expressed in grams and the quantity of water in cubic centimeters. The material should be weighed, placed upon a non-absorbent surface, thoroughly mixed dry if sand be used, and a crater formed in the center, into which the proper percentage of clean water should be poured; the material on the outer edge should be turned into the crater by the aid of a trowel. As soon as the water has been absorbed, the operation should be completed by vigorously mixing with the hands for one minute and a half. During the operation of mixing, the hands should be protected by rubber gloves. The temperature of the room and the mixing water should be maintained as nearly as practicable at 21° C (70° F).

25. *Determination of Normal Consistency.*—The normal consistency for neat paste to be used in making briquettes and pats should be determined by the ball method, as follows:

26. A quantity of cement paste should be mixed in the manner above described under mixing cement pastes and mortars, and quickly formed into a ball above 2 inches in diameter. The ball should then be dropped upon a hard, smooth, and flat surface from a height of 2 feet. The paste is of normal consistency when the ball does not crack and does not flatten more than one-half of its original diameter.

27. Trial pastes should be made with varying percentages of water until the correct consistency is obtained.

28. The percentage of water to be used in mixing mortars for sand briquettes is given by the formula:

$$y = \frac{P}{n+1} + K$$

in which y is the percentage of water required for the sand mortar. P is the percentage of water required for neat cement paste of normal consistency; n is the number of parts of sand to one of cement by weight, and K is a constant which for standard Ottawa sand has the value 6.5.

The percentage of water to be used for mortars containing 3 parts Standard Ottawa sand, by weight, to 1 of cement is indicated in the following statement:

Percentage of water for neat cement paste	Percentage of water for 1 to 3 mortars of standard Ottawa sand
18	9.5
19	9.7
20	9.8
21	10.0
22	10.2
23	10.3
24	10.5
25	10.7
26	10.8
27	11.0
28	11.2
29	11.3

29. *Determination of Soundness.*—Pats of neat cement paste of normal consistency about 3 inches in diameter, one-half inch in thickness at the center, and tapering to a thin edge should be kept in moist air for a period of 24 hours. One pat should then be kept in air and a second in water, at the ordinary temperature of the laboratory not to vary greatly from 21° C (70° F), and both observed at intervals for at least 28 days. A third pat should be exposed to steam at atmospheric pressure above boiling water for 5 hours.

30. *Determination of Time of Setting.*—The time of setting should be determined by the standardized Gillmore needles, as follows: A pat of neat cement paste about 3 inches in diameter and one-half inch in thickness with flat top, mixed at normal consistency should be kept in moist air, at a temperature maintained as nearly as practicable at 21° C (70° F). The cement is considered to have acquired its initial set when the pat will bear, without appreciable indentation, a needle one-twelfth of an inch in diameter loaded to weigh one-fourth of a pound. The final set has been acquired when the pat will bear without appreciable indentation, a needle one twenty-fourth of an inch in diameter, loaded to weigh 1 pound. In making the test the needle should be held in a vertical position and applied lightly to the surface of the pat. The pats made for the soundness test may be used to determine the time of setting.

31. *Tensile Tests.*—Tensile tests should be made on an approved machine. The test pieces shall be briquettes of the form recommended by the Committee on Uniform Tests of Cement of the American Society of Civil Engineers, and illustrated in Circular 33 of the Bureau of Standards. The briquettes shall be made of paste or mortar of normal consistency. Immediately after mixing, the paste or mortar should be placed in the molds, pressed in firmly by the fingers and smoothed off with a trowel without mechanical ramming. The material should be heaped above the mold, and in smoothing off, the trowel should be drawn over the mold in such a manner as to exert a moderate pressure on the material. The molds should be turned over and the operation of heaping and smoothing off repeated. Not less than three briquettes should be made and tested for each sample for each period of test. The neat tests are not considered so important as the sand tests. The briquettes should be broken as soon as they are removed from the water. The load should be applied at the rate of 600 pounds per minute.

32. *Storage of Test Pieces.*—During the first 24 hours after molding the test pieces should be kept in air sufficiently moist to prevent them from drying. After 24 hours in moist air the test pieces should be immersed in water. The air and water should be maintained as nearly as practicable at 21° C (70° F).

33. *Standard Sand.*—The sand to be used shall be natural sand from Ottawa, Ill., screened to pass a No. 20 sieve and retained on a No. 30 sieve.

34. Sand having passed the No. 20 sieve shall be considered standard when not more than 2 grams pass the No. 30 sieve after one minute continuous sifting of a 200-gram sample.

35. The No. 20 and No. 30 sieves shall conform to the standard sieve specifications of the Bureau of Standards, Department of Commerce and Labor.

The circular of the Bureau of Standards also contains three other sections. The first deals with methods of chemical analysis, and is practically a reprint of the report of a sub-committee of the New York section of the Society of Chemical Industry. The next part deals with the interpretation of chemical and physical results of tests in which are given many important suggestions. For instance, it is explained that "only the extremely fine powder of cement, called flour, possesses appreciable cementing qualities"; but "no sieve is fine enough to determine the flour in a cement, nor is there any other means of accurately and practically measuring the flour. * * * With cement from the same mill, with similar clinker and grinding machinery,

however, it is probable that the greater the percentage which passes the 200 mesh sieve the greater the percentage of flour in that particular cement."

A fourth part is added giving auxiliary specifications for sieves and specific gravity flasks of the kind adopted by the Bureau of Standards.

RESTING PLACES FOR CAR PATRONS

In some cities the streets are defaced by cheap wooden sheds which are used as resting places for those who are waiting for the street cars; in fact, some cities permit the use of abandoned trolley cars of antique pattern for this purpose (minus their trucks, of course), and the result is a disfigurement to a residential neighborhood. Pasadena, Cal., has recently acquired several new waiting stations along the Pacific Electric right-of-way, which are commendable departures from this practise. The shelter is a concrete structure of dignified design along the lines of the California "Mission" style of architecture. A roof of



RESTING PLACE FOR STREET CAR PATRONS.

red tiles adds to its beauty, and these resting places are ornaments to the attractive sections in which they are located. About a dozen of them have been built this year.

EGG-SHAPED SEWER DESIGN

Adapting Sewer to Unusually Small Dry Weather Flow as Compared to Maximum Capacity

By F. C. SNOW, Asst. Prof. of Civil Engineering, Montana State College.

THE ordinary form of egg-shaped sewer has the following dimensions (referring to the illustration): D equal to the width, H , the height, equal to $1.5D$, r_1 , equal to $1.5D$, r equal to $0.5D$, and r_2 equal to $0.25D$. In using the above shape for a combined sewer it is sometimes found that the maximum storm flow requires so large a value of D that the depth of sewage for minimum sanitary flow is much less than good practice allows.

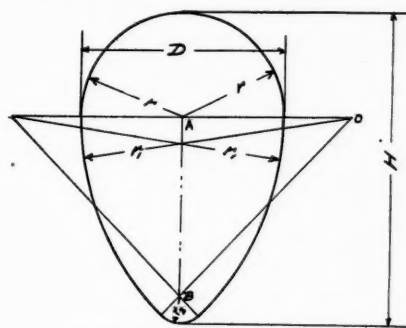


DIAGRAM OF EGG-SHAPED SEWER.

in diameter, will carry a little over 21,000 cubic feet per minute. They also show that an egg-shaped sewer to carry the same amount of sewage requires a value of D equal

For example, take a case where the maximum storm flow is 21,000 cubic feet per minute and the minimum sanitary flow is only 50 cubic feet per minute. Sewer tables (the tables in Fowell's "Sewerage" were used) show that on a 0.002 slope a circular sewer, 8 feet

to the diameter of the circular sewer, divided by 1.209, or in this case D equals 6.6 ft. If r_2 equals $\frac{1}{4}D$, r_2 equals 1.65 feet. If a sewer having this radius of invert carried 50 cu. ft. per minute, the sewage would have a depth of about one-tenth of the diameter of a circular sewer of his radius, or 0.33 feet. This would be about one-fifth of the radius of the invert, and good practice seems to require a depth of at least one-half the radius of the invert.

To fulfill this last condition, namely, that the sewer when carrying 50 cubic feet per minute must have a sewage depth of at least one-half the depth of the invert, r_2 would have to be 0.9 foot, since the tables show that a circular sewer, 22 inches (practically 1.8 feet in diameter) when flowing 0.25 full (depth of sewage equals 0.25 diameter of pipe), will carry approximately 50 cubic feet per minute on a 0.002 slope.

If r_2 is to equal 0.9 foot and D equals 6.6 feet, the following formula will determine r_1 when H equals $1.5D$.

$$r_1 = \frac{D}{4} \left(\frac{5D - 8r_2}{D - 2r_2} \right)$$

This is proved thus: Referring to the illustration, in the right triangle AOB:

$$AB \text{ equals } 1.5D - 0.5D - r_2 \text{ equals } D - r_2$$

$$AO \text{ equals } r_1 - 0.5D$$

$$BO \text{ equals } r_1 - r_2$$

$$\text{and } AB^2 + AO^2 = BO^2$$

$$\text{Substituting } (D - r_2)^2 + (r_1 - 0.5D)^2 = (r_1 - r_2)^2$$

Reducing

$$r_1 (D - 2r_2) = D \left(\frac{5}{4} D - 2r_2 \right)$$

which reduces to the form given above.

Applying this formula to the case in hand,

$$r_1 = \frac{6.6}{4} \left(\frac{5 \times 6.6 - 8 \times 0.9}{6.6 - 1.8} \right)$$

$$r_1 = 8.87$$

The sewer has the following dimensions:

D equals 6.6, r equals 3.3, r_1 equals 8.87, r_2 equals 0.9 and H equals 9.9. All in feet.

This method is somewhat approximate on account of the fact that the tables used in determining D are based on the ordinary form of egg-shaped sewer and the dimensions figured do not correspond to these. However, the tables are based on sewers flowing full, while in fact the maximum carrying capacity of a sewer occurs when it is somewhat less than full. This makes the above method of working allowable, but it would not be safe to use this design without checking results, by figuring the discharge by formula. This is done below:

P equals wetted perimeter of above sewer, equals 25.9.

A equals area of the above sewer, equals 48.8.

R equals the hydraulic radius of the above sewer, equals

A
— equals 1.8.

P

C equals coef, from Kutter's formula, equals 110.

V equals velocity of flow in sewer, equals $C \sqrt{RS}$, equals 6.6 ft. per sec., where S equals the slope of the sewer, .002

Q equals the quantity flowing, equals $AV (60)$, equals 19,500 cu. ft. per minute.

This is the discharge when flowing full, and is a little too small, as 21,000 cu. ft. per minute were to be carried.

Testing for a depth of flow equal to 0.9 the depth of the sewer, the following is obtained:

P equals 20.6 ft.; A equals 45.5 sq. ft.; R equals 2.2; C equals 113; V equals 7.6 ft. per sec.; Q equals 20,800 cu. ft. per minute.

This shows that the sewer is of sufficient size and of the proper dimensions to carry a maximum flow of approximately 21,000 cu. ft. per minute and a minimum flow of 50 cu. ft. per minute, so that this last will have a sufficient depth of flow to prevent deposits.

NEW ORLEANS BENCH MARKS

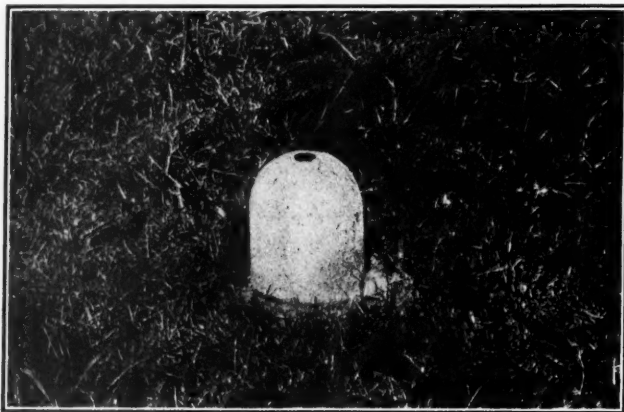
Permanent Construction of Granite Bedded in Concrete to a Depth of Three Feet—Leveling Between Benches

WHEN the Sewerage and Water Board of New Orleans prepared the plans for the systems which it has been constructing during the past ten years it provided temporary bench marks at intervals of about a mile, which consisted for the most part of 6-inch galvanized boat spikes driven horizontally into trunks of trees about 30 inches above the ground. In 1901 a system of levels was carefully run connecting these benches, and the elevations used for the sewer and drainage work. These benches proved much more perishable than had been anticipated, and the need of a really permanent system covering the entire city was recognized, and in 1906 a few permanent bench marks were established, and additional ones have been placed from time to time since then, until at the time of the latest published report 28 of these had been placed.

The permanent type of bench determined upon consisted of a granite monument of about 200 pounds weight set in a large block of concrete. These were set chiefly in public squares and parks, but the locations where they could be safely placed were limited, as any excavations near them would subject them to the danger of settlement. In those sections where no suitable locations for regular monuments could be found copper pins were set in the foundations of pumping stations and such other suitable structures as could be found. By including a few of the benches established by the United States engineers, all sections of the city have been provided with permanent bench marks reasonably close together.

The levels for establishing the elevations of these permanent bench marks were begun in February of 1910 and were described in the report of General Superintendent Geo. G. Earl as follows:

"The work was done with a 22-inch Gurley wye level and a Philadelphia rod with rod level. The target was dispensed with, and the rod used throughout as a self-reading rod. The cross wires of the instrument were replaced with spider lines, and accuracy of reading was further facilitated by placing alternate graduations opposite the regular graduations on the rod, so that all readings could be made on a white ground. At the beginning



REGULATION GRANITE BENCH MARK, NEW ORLEANS.

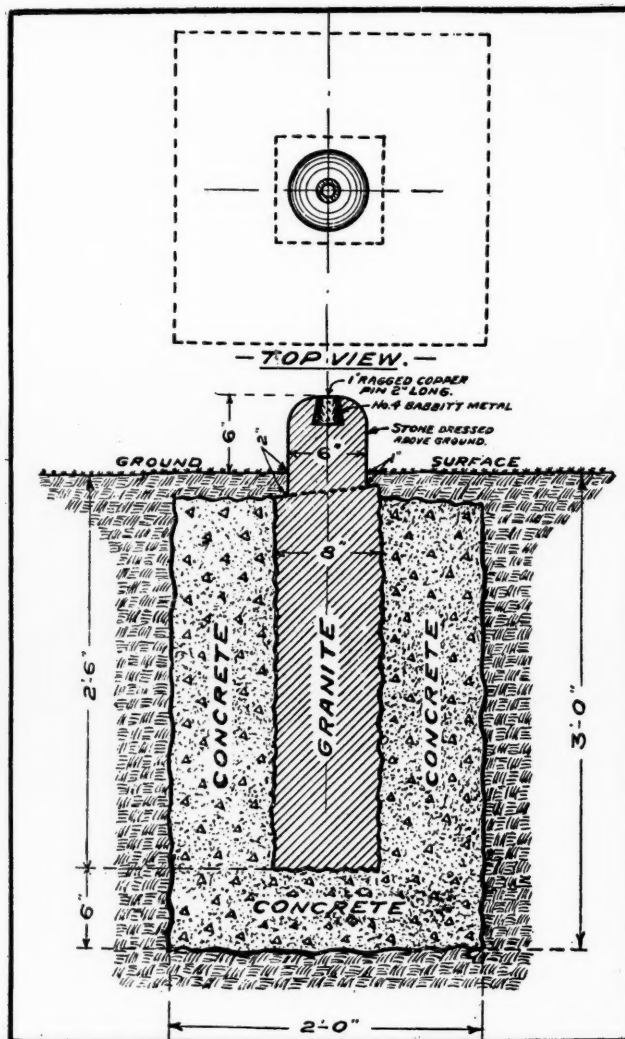
of the work two rods were used, but this method was quickly abandoned, owing to the difficulty of getting identical rods.

"Fixed turning points were used, consisting of pegs or nails (always driven vertically), according to local conditions; and these points were numbered consecutively from bench to bench. The distance was paced off and the instrument placed midway, giving sights of about 249 feet.

From bench to bench constituted a separate run, complete within itself, in each case. The start would invariably be made from a bench whose elevation had already been determined, and a direct run made to the next bench. A return run was then made over the same turning points, in reverse order, to the initial bench of the run. A closure of 0.025 foot per mile of double line, so run, was adopted at the outset as the limit of error. The work was done well within this limit. The maximum error for the entire work, involving 45.5 miles of double line, was 0.019 foot; the minimum 0.006 foot, and the average 0.007 foot per mile of double line.

"This close work was largely due to the method of making the return run, in each case, over the same turning points and fixing a limit of error for each setting on the return run. This limit for all but a small part of the work was fixed at 0.002 foot, experience having shown the practicability of fixing it this low. If any setting on the return failed to check, within the limit, with the original setting between the same points, as regards the difference of level between them, then the setting would be repeated until a satisfactory check was obtained. These check settings would be made alternately for the direct and the return run, the bubble being read from opposite sides of the instrument for the two runs. The rule adopted was to read the bubble from the left side of the instrument, and to use the left eye for backsights and the right for foresights. In this way all conditions were reversed on the return run from those obtaining on the direct run, except the angle of the light.

"Favorable weather conditions were utilized as far as practicable. In this way errors due to active convection



REGULATION PERMANENT BENCH MARK, NEW ORLEANS.

of the air or to wind were largely eliminated. But the source of error most difficult to overcome was due to the effect of different light in reflecting the edges of the bubble, notwithstanding every effort to properly shade the bubble, and to hold the eye as nearly vertical over it as practicable. It was found that the effect of light from different angles with the axis of the instrument and as reflected from local objects such as trees or isolated houses, was to cause a different centering of the bubble when viewed from opposite sides of the instrument. It was conclusively proved in several instances that the error of centering was in such cases chiefly, if not wholly, on one side, and therefore a mean of the two readings would not give the correct result. This effect was always more pronounced in the early morning and late afternoon than at or near mid-day.

"Upon reaching the initial bench with the return, for each run, the mean difference between the two benches, as developed by the direct and return runs, was taken as correct, the elevation of the forward bench worked out accordingly, and used as the initial elevation for the next run, and so on.

"One large circuit and several smaller loops were closed during the course of the work with the following results:

"The large circuit was one of 13 miles, in which the final error of closure was +0.015 foot. This error was prorated back around the circuit. A crosstown line of 3.5 miles was then run, cutting this circuit approximately in half, with a closure of +0.031 foot.

"Loops were made from this main circuit, starting at one point on the circuit and closing at another, or on a similar loop; secondary loops were made from these in some cases. One of these loops, 4.75 miles in length, gave a closure of +0.018 foot; another, of 4.75 miles, -0.013 foot; and another, of 2.25 miles, -0.001 foot. Such errors were prorated back around the loop to the starting point, except, of course, the last mentioned. The crosstown closure of 0.031 foot, above mentioned, was the largest error developed in any case.

SANITARY RESEARCH—A SUGGESTION

Health Preservation, Municipal House Cleaning, Recreation,
Industrial Supervision, Water Supply, Sewerage
and School Sanitation

By T. L. HINCKLEY, of the New York Bureau of Municipal Research.

THE tendencies of the present day in the general field of social welfare, particularly in so far as our cities are concerned, are rapidly crystallizing around a very few basic principles, which he who runs may understand. The tendency to a sort of stocktaking, to the application of a few scientific methods, to the study of those problems of city life, which have up to now been largely viewed as apart from the sphere of influence of science, is spreading in all sections of the country and in a short time will undoubtedly become one of the characteristic features of our urban life. Attention in this connection is especially called to the many bureaus for municipal research, which are now operating in many leading cities and are trying to do for the community what the chosen administrative officers of the community have either been unable or unwilling to undertake themselves.

Perhaps the term "sanitary research" is too imposing a name to give to what is really a subdivision of this municipal research movement. This, however, depends upon the comprehensiveness of the word "sanitation." In the writer's opinion sanitation can very properly be held to include all those branches of municipal activity which have to do, in however slight degree, with the health of the population. It will be understood in what follows that by

sanitary research is meant the application of those principles which govern the larger research program to the entire field of municipal sanitation.

Lest there be some confusion between the research idea and the strict sanitation idea it must be said that the former is the servant of the latter. Research is dependent upon science to the extent of the enunciation of the true basis upon which sanitary reform must proceed; from that point on research takes up the fight and sees to it that these scientific principles are made use of.

Strictly speaking, there should be no need of this sanitary research, any more than of any other type of administrative research, if our municipal governments were what they should be. Our political system, however, has so generally fallen down in respect to efficient municipal management that if our towns are to keep pace with the towns of other nations then our people must pitch in and get hold, with the elected official, of the common problem. It is not a question of what cities *know* about improved methods of sanitation—of the best way to clean streets, the safest way to handle refuse, the proper safeguards to throw about the sale of milk, etc.; it is now a question of what they actually *do* to make themselves fit places to live in, and there are so many instances of where local authorities have failed to apply the well understood facts of science or the results of experience that the term "sanitary research" seems worthy of keeping.

Once detached from the general municipal research program the field under discussion may be held to include the establishment of efficiency in the following lines:

(a) Health work as it is commonly known, viz., in the matter of the adequate inspection of food, of dwellings, of places of business, of public conveyances, of all places where the public is wont to congregate; in the matter of the enforcement of health ordinances, the publication of vital statistics; while the knowledge that they impart can be made use of—the adoption of the latest and most approved methods for the handling of contagious diseases, the provision of proper facilities for the care of the injured, etc.

(b) Street Cleaning.—Prompt and thorough removal of litter and accumulations, avoidance of nuisance from dust, economic disposal of the sweepings, etc., without risk to the public health; systematic control of the working force, installation of modern appliances for street cleaning.

(c) Garbage Disposal.—Reasonable regulations regarding the time and manner of collecting garbage, rigid supervision of all such collection and removal of garbage, scientific final disposal of all refuse, with due regard to the business aspects of this function.

(d) Housing.—Regulations as to the size, location, materials of construction, number of occupants and provision against fire of all tenement buildings, enforcement of city ordinances and State laws governing tenements.

(e) Recreation.—Proper number and location of centers for popular amusement and recreation, adequate police powers in respect to the same.

(f) Industrial Supervision.—Requiring the compliance of manufacturers with the regulations—where such exist—touching safety appliances, hours of labor, age of employes, etc.; demanding from all employers that careful supervision of their laboring force which is essential to the maintenance of the public health.

(g) Water and Sewerage Oversight.—General insistence upon the known sanitary safeguards, efficient work on the part of employes, improved methods of maintenance of pipes and of cleaning same, adequate provision for future population and for emergencies, such as fire and leakage, in case of water, and in the case of sewerage the provision of suitable final treatment of the discharge.

(h) School Sanitation.—Insistence upon up-to-date

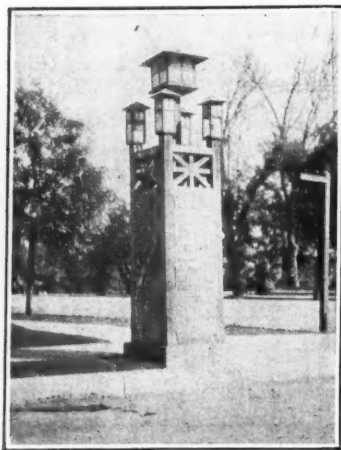
ventilating and heating appliances and upon medical inspection of pupils, segregation of pupils into special classes, where necessary, etc.

A thoroughly live and efficient sanitary administration would, of course, charge itself with most of these tasks without prodding from the citizen body, providing it were not so subdivided in form or crippled in personnel that it could not follow out its ambition. Unfortunately there exist many sanitary administrations which are so hampered; and it is precisely in such a case that the present idea should find ready application. In many towns there is excessive infant mortality, typhoid fever, tuberculosis; in many towns there are social conditions which should not be permitted to exist a minute longer; in many towns certain manufacturers are proceeding in defiance of law and in constant antagonism to the public health program; in many cities money is being carelessly thrown away on some phases of sanitary work when it is well known, or is at least suspected, that there is "something wrong." New York City, in spite of efforts at business reform, which have extended over several years' time, was until very recently an instance of this, having been paying a large sum of money to a garbage contracting firm, which was already making an exorbitant profit out of the sale of the garbage after it had been reduced. Such things as this will continue in the event of a sanitary authority being either too unwieldy or too greatly subdivided to proceed without fear of trespass on the field of some other municipal function to put into forceful use the sanitary, scientific, engineering or administrative knowledge, of which foreign cities to-day make such conspicuous adaptations.

To carry on a program such as outlined will require rather a well-rounded individual with considerable administrative and technical acquirements. Such a person will have deep-rooted prejudices to undermine and hostile municipal officers to combat, unless he is more than ordinarily tactful. With a portion of the thinking public to support his actions he will be enabled to push his demands into the notice of those elected officers who have the legal power to see that the reform ideas get fair trial at least. In spite of much passive opposition on the part of that numerous body of the people, who are content always to "let well enough alone," it is still believed that a sincere worker for the adoption of the modern civilized "sanitary code" will achieve results that will convert latent hostility into active co-operation and thus swing a community into line with sanitary progress even against its will.

A NOVEL LAMP POST

THE cities of California probably embody more "local atmosphere" in their municipal and private structures than in any other part of the country. The illustration shows a lamp post in which the mission style has been adopted.



MISSION LAMP POST.

This is constructed of timber filled in with brick resting on a concrete foundation. The corner timbers are 3 x 3 inches in cross section, and at the top of the masonry, about 5 feet above the sidewalk, are continued and supplemented by a decorative design of wood, the whole being used to support four upright lamps at the corners and a larger and higher one in the center. The total height above the sidewalk is a little more than 8 feet.

MODERN REFUSE DISPOSAL PLANTS

Review of American Experience—Figures Concerning Operation of Cleveland and Columbus Plants—Buffalo Rubbish Incinerator

IN a report made to the city of Toronto a few weeks ago, Hering and Gregory, consulting engineers, of New York, reviewed this general subject at considerable length. While there was little in the report which has not already been published by us, it gives information concerning several of the newest plants in a compact form convenient for reference, and for this reason abstracts from the report are given below.

The first furnace on this side of the Atlantic Ocean which has not only given complete satisfaction, both from a sanitary and economical point of view, but has utilized the heat created by the burning, is the one which was constructed in 1906 and has since been operated at Westmount, a suburb of Montreal, Canada. It is situated not very far from residences, burns all kinds of refuse and supplies heat for generating electricity, which assists in lighting the town. As first built the incinerator had only one furnace, having a capacity of burning fifty tons of refuse per day; the operation of this furnace was so satisfactory that a second furnace has since been added. The cost of incineration at Westmount, including fixed charges, for the three years, 1907, 1908 and 1909, averaged 88 cents per ton of refuse. The heat value for the same period was 36 cents per ton, making the net cost of incineration 52 cents per ton of refuse.

Since then a number of other projects have been successfully carried out in Canada and the United States, among which may be mentioned those at Vancouver, 1907; Seattle, 1908; West New Brighton (New York City), 1908, and Milwaukee, 1910, the dates referring to the years in which the incinerators went into operation. The incinerator erected in West New Brighton, in the Borough of Richmond, New York City, was designed on principles determined by the Borough Department, and calculated to consume general refuse and utilize the heat for power. This furnace has given satisfactory results and in January of the year 1911 bids were received for a second incinerator.

The largest refuse incinerator in America is in the city of Milwaukee and has been in operation about a year and one-half. The incinerator has a capacity for burning a total of 300 tons of mixed refuse per 24 hours, and consists of four furnaces, each capable of burning 75 tons per 24 hours. With three furnaces in operation the net rated capacity of the works is 225 tons per 24 hours. The total cost of the works, exclusive of land, was \$212,007. A careful investigation of the operation of the incinerator for the first three months of 1911 was made by the Milwaukee Bureau of Economy and Efficiency, and during this period it was found that the actual total cost of operation, including interest, depreciation, etc., was \$1.65 per ton of refuse. With modifications in the method of operation of the furnaces along the present general design, the report further states that this cost can be reduced to \$1.30 per ton. No funds were provided for the necessary equipment to produce power from the steam generated at the incinerator or to crush the clinker, but it is the intention to add the necessary equipment and produce electric current and also to install a clinker mill in order to derive a corresponding revenue.

The latest refuse incinerator built along still more favorable lines is in the city of Montgomery, Alabama, and has been operated since last July. It consists of one 60-ton furnace of four grates, with hydraulically operated top-feed doors. The refuse is mixed, consisting of garbage,

rubbish and ashes, and is dumped from the collecting carts directly into storage hoppers immediately above the containers which top-feed into the furnace. The clinkering is done by hand. The clinker falls into a car which is removed and automatically dumped by a hoisting engine and then returned. The labor has been reduced below that required at Milwaukee because of the machine feeding and clinker removal. It is fair to estimate that, with improvements similar to those at Montgomery, the labor cost can be reduced below that at Milwaukee to the extent of about 20 cents per ton.

Both in Europe (Hamburg, Barmen and Zurich) and in the incinerators to be built in San Francisco, further reductions in operating cost are either being secured or are expected.

TABLE II—GREASE PRODUCED AT THE CLEVELAND GARBAGE REDUCTION WORKS.

Year	Weight of material					
	1905	1906	1907	1908	1909	1910
Garbage, in tons	30,382	34,891	37,606	41,247	44,590	44,747
Grease in tons	799	1,070	1,183	1,420	1,670	1,678
Percentage of grease, by weight, of garbage	2.63	3.07	3.14	3.44	3.74	3.75

Regarding the income to be derived from incinerators, figures from England, from the aforementioned continental cities, as well as from Westmount, Vancouver and Seattle, all show a tendency to increase.

With a careful analysis of the materials contained in refuse, and of its physical conditions, it is not a difficult engineering problem to foretell the results that must follow. There are precedents under conditions similar to those of the cities mentioned, all of which allow such a forecast to be made with no question as to the final result.

* * * * *

The disposal of garbage by reduction and the recovery of the by-products has been practised for many years and is the chief method of disposal in the larger cities of the United States, where it has been found that the garbage is sufficiently rich in grease to justify its extraction. Among those cities may be mentioned Boston, New York, Philadelphia, Baltimore, Washington, Buffalo, Indianapolis, Cleveland, Columbus, Ohio, Chicago and others. In all of these cities, except Cleveland and Columbus, Ohio, the reduction works are owned and operated by private parties and solely for profit.

Until within a few years but little knowledge could be obtained as to the profits which would accrue from the reduction of garbage and the sale of the products obtained therefrom. On January 1, 1905, the city of Cleveland, Ohio, purchased the reduction works from the private company owning them. From this time on they have been operated by the city and figures are now available which show what return can be obtained from the production and

sale of grease and tankage. The annual cost of operation of and income from the reduction works at Cleveland for a period of six years are given in Table I., and an examination of this table will show what profit accrues to the city from the operation of these works.

The amount of grease which can be extracted from garbage, of course, varies, and depends on the character of the garbage and on the details of the process carried out at the works. The amount of grease produced at the reduction works at Cleveland for a period of six years is given in Table II., and from this table it will be seen that the grease varied from 2.63 per cent. in 1905 to 3.75 per cent. in 1910. The increase in the percentage of grease recovered is due to the introduction of improved methods and machinery and especially to the introduction of the naphtha process.

The prices received for grease and tankage have varied from time to time, depending on market conditions. The prices received for grease and dry tankage at the reduction works at Cleveland for a period of six years are given in Table III. The average price received for grease was 3.80 cents per pound and for dry tankage \$7.19 per ton.

TABLE III—PRICES RECEIVED FOR GREASE AND DRY TANKAGE AT THE CLEVELAND, OHIO, GARBAGE REDUCTION WORKS, 1905-1911.

Period.	Grease per pound.	Dry tankage per ton.
Jan. 1, 1905, to June 30, 1905.....	\$2.85	\$7.08
July 1, 1905, to Dec. 31, 1905.....	2.91	7.02
Jan. 1, 1906, to June 30, 1906.....	3.02	8.42
July 1, 1906, to Dec. 31, 1906.....	3.76	8.49
Jan. 1, 1907, to June 30, 1907.....	4.25	7.85
July 1, 1907, to Dec. 31, 1907.....	4.30	6.89
Jan. 1, 1908, to June 30, 1908.....	4.35	6.71
July 1, 1908, to Dec. 31, 1908.....	3.99	5.89
Jan. 1, 1909, to June 30, 1909.....	3.46	7.68
July 1, 1909, to Dec. 31, 1909.....	3.95	6.81
Jan. 1, 1910, to June 30, 1910.....	3.98	6.98
July 1, 1910, to Dec. 31, 1910.....	4.72	6.42
Average	\$3.80	\$7.19

The only other city in the United States which owns and operates a municipal garbage reduction works is the city of Columbus, Ohio. These works, built by the city, have a total capacity of handling 160 tons of garbage per day. They were completed in 1910, have been in operation somewhat over a year, and have been satisfactory, as they are run in a strictly sanitary manner and give no offense. At

TABLE I—ANNUAL COST OF OPERATION OF AND INCOME FROM THE GARBAGE REDUCTION WORKS AT CLEVELAND, OHIO, 1905-1910.

Year	1905	1906	1907	1908	1909	1910
Population	468,000	486,000	506,000	525,000	543,000	560,663
Garbage collected, tons	30,382	34,891	37,606	41,247	44,590	44,747
Total cost of works to end of current year.....	\$70,495	\$85,328	\$190,830	\$223,782	\$225,551	\$232,108
<i>Cost of operation—</i>						
Operation of reduction works	54,450	83,384	85,294	89,091	88,746	85,307
Freight on raw garbage*	4,561	5,285	5,824	6,225	6,587	6,260
Unclassified	3,157	75	171	713	97	187
Total (exclusive of interest and depreciation).....	\$62,168	\$88,744	\$91,289	\$96,029	\$95,430	\$91,754
Interest at 4 per cent. on cost of works.....	2,820	3,413	7,633	8,951	9,022	9,284
Depreciation charged off	3,154	3,918	9,902	18,093	16,156	16,591
Total cost of operation	\$68,142	\$96,075	\$108,824	\$123,073	\$120,608	\$117,629
<i>Income—</i>						
From sale of product	\$57,336	\$96,351	\$116,324	\$143,711	\$148,855	\$173,322
From inventory of product	5,563	8,694	11,979	2,582	11,242	16,839
Total income from product.....	\$62,899	\$105,045	\$128,303	\$146,293	\$160,097	\$190,161
Total net annual income	\$5,243	8,970	19,479	23,220	39,489	72,532

*From Cleveland to reduction works at Willow. †Deficit.

the preset time the naphtha process is not in use, but it is to be installed, the work being now well under way. The total cost of construction of the reduction works, exclusive of land and engineering, was \$189,542. Adding to this the cost of land, loading station, railroad siding and engineering, \$46,028, the total expenditure was \$235,560.

The results of operation of the Columbus works for the first six months of 1911 have recently become available. The amount of grease actually recovered, without the use of the naphtha process, was 2.57 per cent., and the amount of tankage 16.8 per cent. of the weight of garbage reduced. Careful analyses were made of the dry tankage during this period, which indicated that the dry tankage still contained approximately 10 per cent. of grease. From this tankage 8 per cent. of grease is recoverable, and to recover which the naphtha process is being installed. With the naphtha process it is expected that the amount of grease recovered will be about 3.9 per cent., and the dry tankage 15.5 per cent. of the weight of garbage reduced.

The average price received for grease at Columbus during the first six months of 1911 was 5.19 cents per pound and the average price for dry tankage \$9.14 per ton. The higher price received for the tankage is due to the fact that the tankage produced at these works had the syrup from the evaporators mixed with it, and had, therefore, a greater percentage of valuable ingredients and was of a better grade than that ordinarily produced in reduction works.

The total net receipts at the Columbus works from the sale of the by-products recovered during the first six months of 1911 were \$29,616. The expenditures for the same period, including freight on the garbage, were \$17,332, which, with an interest and sinking fund charge of 5.78 per cent. per annum on \$235,560, or \$6,808, would make the total cost of operation \$24,140. It will be seen, therefore, that the net profit for this period was \$5,476, or at the rate of \$10,952 per year. As these works at present are

operating at much less than their rated capacity, the net profits from an increased amount of garbage would be correspondingly increased.

DISPOSAL OF RUBBISH.

A brief description of the method as carried out in Buffalo will serve to illustrate what can be done towards utilizing the salable material in rubbish. The rubbish is delivered in Buffalo at a rubbish incinerator, and after having been dumped from the wagons is raked over onto a conveyor. The conveyor transports and lifts the rubbish to a sorting room. Stationed on each side of the conveyor are six assorters, and as the rubbish is conveyed past them they pick out the materials which are salable. In Buffalo mainly women are employed for this work of sorting, but the bottles and certain other miscellaneous materials are picked out by boys or men. The materials are then thrown into different bins, each girl assorter picking out only one class of material. Situated beneath these bins are machines in which the various classes of paper and bags are pressed and baled ready for shipment.

The remainder of the rubbish which is not salable passes to another part of the building and is burned in a rubbish incinerator, the heat being utilized to produce steam which operates the conveyor and the remainder is sold to the sewage pumping station connected with the incinerator.

The annual cost of operation of and income from the rubbish incinerator at Buffalo, where the salable portions of the rubbish are utilized, for a period of four years, 1907 to 1911, are given in Table IV. Briefly stated, the total cost of operation, and including a small amount of new construction for the four years, was \$148,042, and the total income from the sale of material picked out and from the sale of steam to the sewage pumping station was \$147,375. It will be seen, therefore, that the rubbish incinerator was practically self-sustaining, or, in other words, that the rubbish, after having been collected, was disposed of with practically no cost to the city.

TABLE IV—ANNUAL COST OF OPERATION OF AND INCOME FROM THE RUBBISH INCINERATOR AT BUFFALO, N. Y., 1907-1911.

	1907-1908 13½ months	1908-1909	1909-1910	1910-1911	Total for four years
Operation—					
Pay roll	\$23,283	\$22,940	\$26,839	\$31,615	\$104,677
Maintenance and repairs	5,853	6,045	6,086	5,507	23,491
Interest on bonds	2,000	2,000	2,000	2,920	8,920
Hauling ashes from plant	4,395	1,453	.....	.....	5,848
New construction .....	.....	.....	3,606	1,500	5,106
Total	\$35,531	\$32,438	\$38,531	\$41,542	\$148,042
Income—					
Newspaper	\$10,104	\$9,008	\$10,020	\$11,485	\$40,617
Mixed paper	19,382	17,375	20,187	18,812	75,756
Manila paper	320	.....	2,880	3,062	6,262
Rags	1,245	1,128	1,122	1,128	4,623
Flour bags	368	418	581	368	1,735
Charcoal bags	156	133	160	98	547
Magazines	47	4	.....	.....	51
Beer bottles	473	290	196	333	1,292
Mixed bottles	450	338	531	716	2,035
One-half gallon bottles	27	24	19	.....	70
Ammonia bottles	24	24	22	.....	70
Tin cans	719	339	504	1,049	2,611
Scrap iron	157	303	60	22	542
Old rubbers, etc. ....	.....	.....	65	.....	65
Broken glass .....	.....	.....	20	.....	20
Old shoes .....	.....	.....	28	84	112
Sundries .....	.....	.....	.....	5	5
Total	\$33,472	\$29,384	\$36,395	\$37,162	\$136,413
Deductions for moisture	1,164	748	22	.....	1,934
Total net income, exclusive of sale of steam	\$32,308	\$28,636	\$36,373	\$37,162	\$134,479
Steam furnished sewage pumping station	3,553	2,629	2,803	3,909	12,894
Total receipts	\$35,861	\$31,265	\$39,176	\$41,071	\$147,373
Population .....	.....	417,000	423,715	429,000	.....
Weight of material sold, tons	4,247	4,412	5,110	5,396	19,165
Weight of rubbish burned, tons	8,493	8,828	10,220	10,794	38,335
Weight rubbish handled, tons	12,740	13,240	15,330	16,190	57,500
Weight of ton of rubbish handled, exclusive of sale of steam ..	\$2.53	\$2.16	\$2.37	\$2.30	\$2.34

and that two-thirds of total weight of rubbish is burned and one-third sorted out.

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MAY 30, 1912.

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Fair Dealing for Bidders

In the early part of this year the Board of Public Works of Boise, Idaho, received bids for sewer work estimated by the engineer to cost about \$83,000, no restrictions being made as to the kind of pipe. For one district a local company was the lowest bidder, its bid being based on the use of cement pipe, which is manufactured in Boise. For the other district the lowest bid was that of an out-of-town contracting firm, which bid \$2,000 lower if vitrified clay pipe were used than if cement pipe. In awarding the contracts the Board selected the lowest bidder in each case. For the first-named contract a local company and a local product were combined in the low bid, and there was no objection on this score, although the advocates of vitrified clay pipe vigorously urged upon the Board the undesirability of cement pipe for sewers. But the awarding of the other contract to an outside firm and for vitrified clay pipe, when the manufacture of cement pipe was a home industry, received considerable adverse comment.

In a letter to the Mayor and Common Council the Board

of Public Works defended this action. After stating the facts as given above, the letter continued: "The Board . . . appreciates the fact that by using cement pipe a much smaller portion of the cost of the sewers would be taken out of the city. . . . However, after satisfying ourselves that the Reliance Contracting Company (*the out-of-town bidder*) is a reliable and responsible concern, and being assured by it that only local labor will be employed on the work, we concluded that it was our plain duty to accept its bid. We had invited outside competition both as to contractors and material and thereby precluded ourselves from discriminating against either. We could not logically favor a home product and refuse to favor a home contractor, and vice versa.

"Had we decided to use cement pipe, the added cost, as before stated, would have been \$1,883.40; and had we discriminated in favor of the local contractor, he would have received \$1,217.32 more than the bid of the Reliance Construction Company; or, in other words, the difference between the bid accepted by us and that of the local contractor for constructing the sewers of cement pipe was \$3,100.72."

The idea so frequently advocated by city officials and politicians, that home contractors and home-manufactured materials should be favored at the expense of the taxpayer is not, we believe, a sound one; but the chief point in the above to which we would call attention is the appreciation by the Board of its obligation to deal fairly with those whom it has invited to bid upon its work. To invite outside contractors to give their time and undergo the expense required for investigating the plans of proposed work and submitting a bid, accompanied by a certified check, merely for the purpose of keeping down the bids of local contractors, but with a previous determination to accept the bids of such local contractors, if these were anywhere within reason, is a great injustice to the outside contractors—is, in fact, obtaining their time and services under false pretenses—and should, and we believe in the end generally does, react upon the city in question and finally result in the refusal of outside contractors to bid, with the result that the local contractors obtain a firm grip upon the city's business and combine to obtain extravagant prices for their services and goods.

San Francisco Sewer Appliances

THE city of San Francisco has been doing a large amount of sewer construction during the past two or three years, and this has been quite varied both in design and material employed and methods used for excavating for and constructing them. In excavating in soil other than rock a common contrivance seems to be the use of a stiff-leg derrick spanning the trench, mounted upon a platform which is advanced slowly, the wheels which support it traveling on lines of planks laid near the sides of the trench. This derrick raises the dirt in ordinary dump buckets of about one cubic yard capacity. In one case an orange peel bucket was used in connection with the stiff-leg derrick, the excavation at this point being approximately 35 feet wide.

Another contrivance used in much the same way was a locomotive crane which traveled on a standard gauge track laid about six feet from the side of the trench. This crane was also used in driving sheet piling. On several of the contracts steam shovels were used, these in some cases dumping the excavated material along the side of the trench, and in others into dump carts for immediate removal.

In rock work air drills are used, not only in tunnel work but in open cuts. The contractor for an 8-foot 6-inch concrete sewer in Sansome street used a small portable motor-driven air compressor to operate the drills, the com-

pressor resting in the bottom of the trench only a few feet from the heading and being operated by wires connecting with the power company's cables in the street above. In this case the operators of the two drills attended to the compressor also. The compressor and motor were carried by a small car, which could be run back out of the way on a short line of narrow-gauge track laid in the bottom of the trench, during blasting.

In several instances where large concrete sewers were being constructed very complete concrete mixing plants were employed. In constructing a concrete sewer varying from 2 feet by 3 feet to 4 feet by 6 feet in diameter, the Metropolis Construction Company used a concrete mixing plant mounted upon three short platform cars, the middle of which carried the mixer itself, with an elevator at each end, while the other two, one at each end of the mixer, contained bins carrying sand and stone, respectively. The two elevators raised the material from the bins to the measuring apparatus above the mixer. The concrete was discharged from the mixer directly into the forms through a flume, the train of three cars being moved slowly along a track laid near the side of the trench, as the work proceeded. The sand and stone cars were removed and returned with fresh supplies of these materials whenever necessary.

In the construction of an 8-foot circular concrete sewer in 46th avenue, a stationary concrete mixing plant was constructed by the contractor. In this plant two bins were erected upon trestles, one on each side of and close to the mixer. The proportions of the aggregate were measured on an elevated platform immediately above the mixer and about three feet below the bottoms of the two bins. Narrow-gauge contractor's track was laid over the center of the trench, and a short spur from this brought dump cars under the mouth of the mixer, each car capable of holding a single batch. Another line of track along the other side of the plant brought the stone and concrete, which were elevated by chain buckets to their respective bins.

WASHINGTON SEWER MAINTENANCE

THE 1911 report of Asa E. Phillips, superintendent of sewers of the District of Columbia, states that the department had under maintenance 469.42 miles of pipe sewers, 122.78 miles of main sewers, 4,720 storm water receiving basins, and 10 gravel catchment basins. Of the main sewers 300 feet were cleaned at a cost of \$173.21, or 57¾ cents per foot. Of the pipe sewers 161,190 feet were cleaned, 3,538 cubic feet of material being removed at a cost of \$5,233.99, or 3¼ cents per foot, or \$1.48 per cubic foot (\$39.94 per cubic yard); flushing 5,685,423 feet of pipe sewers (2.3 times the total length), together with inspection of them, cost \$2,993.67, or \$6.38 per mile of sewer. Receiving basins (catch basins) were cleaned an average of 12.75 times each during the year, and an average of 35.25 cubic feet was removed from each basin, or 2.76 cubic feet per cleaning. (This compares most favorably with the average of one-half to two cleanings a year practised in many large cities.) The basin cleaning cost 28.2 cents per cleaning, or \$3.61 per basin maintained, or 10.23 cents per cubic foot of silt removed.

All catch basins were flushed several times by tank wagons from spring to autumn, followed during mosquito

breeding season by a dosing of "mosquito oil." There were 11,950 of such flushings during the year, an average of 2.53 times per basin.

The flushing of streets is found to appreciably increase the amount of dirt to be removed from catch basins and sewers and the total cost of keeping them clean. Just how great this increase is cannot yet be stated, but a study is being made of the subject.

During the year authority was granted for the purchase of two motor trucks, one to be used by field parties on construction work and one for inspection service. As these machines replaced only in part the horse-drawn vehicles, opportunity was taken to study the relative cost and difference in economy between the two means of transportation, with the following conclusions:

(1) The maintenance of the horse-drawn vehicle costs the same, whether in service or not, while that of the motor-driven vehicle stops when not in service.

(2) The horse-drawn vehicle requires double the time per mile of travel and practically consumes in travel 25 per cent. of the field party time as against 12½ per cent. for the motor-driven vehicle.

(3) The horse-drawn vehicle costs 20 cents per mile of actual travel, while the motor-driven vehicle costs 3 cents per mile plus repairs, etc. As these were new machines there were practically no repair charges during the first year and no figures can be given as yet under this head.

These conclusions are tabulated as follows:

COMPARATIVE COST OF ONE MOTOR-DRIVEN AND ONE HORSE-DRIVEN FIELD PARTY WAGON FOR FISCAL YEAR 1911.

Vehicle.	Actual cost	Miles of travel each vehicle.	Cost per mile of travel.	Loss of time of field party in travel.	Total cost per vehicle.
	maintenance one vehicle.			time.	
Horse-drawn¹..	\$450	2,250	\$0.20	\$757.50	\$1,207.50
Motor-driven²..	156	5,280	.03	378.75	534.75

¹Used by one field party. ²Used by two or more field parties.

Making a liberal allowance for repairs, renewals and depreciation on the motor-driven vehicles, it is evident that a very considerable saving results from their use, even were the same number of vehicles required, but in the actual work and in the estimates submitted for the next fiscal year one motor-driven vehicle replaces two horse-drawn vehicles, so that the saving is double that indicated.

The average cost during the year of constructing pipe sewers by day labor is given by the following table. The lack of any data as to depth or kind of material detracts greatly from the value of the figures:

AVERAGE COST OF LABOR AND MATERIAL OF PIPE SEWERS (PER

LINEAR FOOT) CONSTRUCTED BY DAY LABOR.

Size of sewer.	Length.	Cost of		Total.
		Labor.	Material.	
8-inch diameter.....	3,643.1	\$1.0128	\$0.2699	\$1.2827
10-inch diameter.....	20,216.2	1.0208	.3202	1.3408
12-inch diameter.....	18,419.4	1.1667	.3983	1.565
15-inch diameter.....	3,784.4	1.3581	.5173	1.8754
18-inch diameter.....	1,101.2	1.642	.6692	2.3112
21-inch diameter.....	.403.5	1.4982	.7496	2.2478
24-inch diameter.....	687.2	1.8177	1.077	2.8947

Of somewhat more value is another table showing the average costs during the past ten years of sewers of different sizes:

AVERAGE COST OF PIPE SEWERS FOR 10 YEARS.

Year.	8-inch diameter.		10-inch diameter.		12-inch diameter.		15-inch diameter.		18-inch diameter.		21-inch diameter.		24-inch diameter.	
	Labor.	Material.	Labor.	Material.	Labor.	Material.	Labor.	Material.	Labor.	Material.	Labor.	Material.	Labor.	Material.
1902....	\$0.83	\$0.32	\$0.97	\$0.41	\$1.04	\$0.46	\$1.46	\$0.62	\$1.74	\$0.78	\$1.91	\$0.96	\$2.43	\$1.23
1903....	.80	.36	1.03	.53	1.09	.54	1.32	.73	1.52	.81	1.57	1.06	1.74	1.32
1904....	.97	.36	.92	.55	1.17	.65	1.45	.81	1.61	.91	1.94	1.24	2.24	1.47
1905....	.98	.38	.96	.55	1.19	.60	1.41	.77	1.45	.89	1.92	1.01	1.87	1.43
1906....	.87	.33	1.19	.47	1.26	.54	1.41	.67	1.53	.78	1.88	.93	2.45	1.24
1907....	1.42	.43	1.43	.48	1.30	.56	1.46	.70	1.82	.85	2.09	.98	2.78	1.26
1908....	1.34	.42	1.26	.50	1.44	.61	1.69	.75	1.91	.90	1.74	1.14	3.65	1.50
1909....	1.34	.36	1.16	.36	1.46	.46	1.59	.56	1.58	.62	1.67	1.07	1.91	1.18
1910....	1.00	.29	.99	.35	1.12	.43	1.19	.52	1.49	.66	1.52	.85	1.72	1.14
1911....	1.01	.27	1.02	.32	1.17	.40	1.36	.52	1.64	.67	1.50	.75	1.82	1.08

NEWS OF THE MUNICIPALITIES

Current Subjects of General Interest, Under Consideration by City Councils and Department Heads—Streets, Water Works, Lighting and Sanitary Matters—Fire and Police Items—Government and Finance

ROADS AND PAVEMENTS

Improving Streets and Parks

Virginia, Minn.—J. C. Christopherson, street commissioner, has started ten teams and forty or fifty men working on the roads in the city. The rocks are being removed and grading done where needed. Arthur Beischjold, superintendent of parks, has a large force of men employed and is planting about 4,000 trees. New rustic entrances, including gates, have been installed at Olcott Park and a shelter for the park police officers erected. The police shelter building is also a public telephone station from the park. The five young wolves, which were recently acquired, have been placed on exhibition at the Zoo and attract much attention.

Chillicothe to Drag Its Roads

Chillicothe, Mo.—A novel road dragging has been inaugurated by the business men and citizens of Chillicothe. Each class of business, each profession, and the local banks have pledged themselves to take care of one of the eight principal dirt roads leading into the city. Each of the various lines and professions engaged teams and drags and put expert road men in charge. The roads will be dragged for a distance of three miles into the country, where it will be taken up and continued throughout the county. The dragging is to be continued regularly through the summer and the expense will be borne by the business and professional men of Chillicothe.

Repair 100 Miles of Highways in a Day

Junction City, Kan.—Three hundred citizens, by working all day, turned 100 miles of bad highways into 100 miles of good roads. It was good roads day. Not to be outdone by the men, the women turned out and served dinner to the workers. After the day's task was finished the workers were guests of the Automobile Club at a banquet. Large parties of good roads enthusiasts from nearby towns came to watch the work.

Plan System of Graded Roads

Blanket, Tex.—This town has recently voted to incorporate. Chief among the various improvements planned is a system of graded roads, touching every part of this trade territory. Much of the good roads sentiment is due to the local autoists.

More Than 200 Miles Good Roads in County

San Antonio, Tex.—In the matter of good roads Bexars County ranks with any county in the State. Bond issues to the amount of \$600,000 have been issued and expended and the result is there are more than 200 miles of good roads in the county. These roads are easily accessible to automobiles, leading from the city limits in every direction. There are two magnificent loops of over fifteen miles each, which are a delight to autoists. This spring these roads were thoroughly oiled on two occasions and are now dustless. It is said there are no better drives in Texas than these loops afford. The south loop passes by the four Spanish missions and returns via Hot Wells and the Southwestern Insane Asylum. This gives a view of every point of interest. The north loop goes out via Brackenridge Park and Fort Sam Houston and the Austin road. It wanders over hilltops, which give a magnificent view of the surrounding country. In addition to these two loops, there are good macadam roads in almost every direction of the county line. The Automobile Club is now actively supporting a movement for a shell road from San Antonio to the Gulf of Mexico, connecting this city with Rockport and Corpus Christi. Many of the interesting counties are now actively engaged in building the connecting links of this road and by spring it is probable the road will be in first class condition all of the way to the coast. It will not be of standard grade as yet, but it is hoped to accomplish this a little later. In the last six months the counties have done much work to make this road a practical one.

New Law Permits Plenty of Roads

St. Paul, Minn.—Following the decision of the State Supreme Court upholding the validity of the Elwell road law, work on approximately 1,800 miles of new State highway in various parts of the State will probably be started in the immediate future, according to G. W. Cooley, State highway commissioner.

Many Good Highways Built in Alabama

Montgomery, Ala.—More interest is being manifested in road building in Alabama now than at any time in the State's history, according to the annual report of State Highway Commission, which has been printed and submitted to the Governor. The report comprises 56 pages and contains photographs of roads in various counties. "Since the organization of this department more interest has been manifested in our public roads than ever before in the history of Alabama and, better still, more work was done in 1911 than ever before," says the report.

Asphalt Concrete Paving Begun in Fargo

Fargo, N. D.—The Steve Birch & Sons contracting company, now at work resetting the curbing on First avenue and Seventh street, have a large number of teams tearing up First and Second avenues and Roberts street and after all this has been done, the work of putting in the new concrete curbing will be commenced. When there has been granite curbing on the streets this is reset again, but on the streets where there has been no curbing the concrete type is laid. According to the Birch Bros. and Harry Nolan, superintendent for Steve Birch & Sons, it will be about two weeks before the work of putting down the concrete base will begin, and after that has had sufficient time to dry and becomes solid the bituminous concrete, mixed with Bermudez asphalt, will be laid. The members of the firm are confident that the two contracts, which mean the two wards, will be completed by the first of July.

Prizes Offered for Best Roads

Mount Ayr, Ia.—The judges of the Mount Ayr road contest, conducted by the Commercial Club, made the official beginning of the third annual good roads contest. The three men chosen as judges began their official inspection of the nine roads now entered in the contest. As soon as the inspection is completed the work will be begun by the farmers. One road entered in the contest has pledged for 180 days' work and \$180 in money for the making of a good road seven miles long from the corporation. There are fifteen prizes possibly to be won and there may be that many contestants for them. Last year the contest resulted in over \$7,000 worth of donated work being done on the highways running into the town of Mount Ayr. Mayor H. M. Miller, Dr. E. C. Sheumaker and R. C. Smith are the judges. The latter two were chosen because they are constantly observing the roads, and Mayor Miller because, as chairman of the street and alley committee while on the town council, he made a reputation for having "road sense." Over \$100 in cash prizes are offered by the Commercial Club and both the Ayr line and the Waubonsie, both ways from Mount Ayr, are entered in the contest. One or two of the clubs are offering prizes for work done in the club.

Invents Substitute for Telford Foundation

St. Louis, Mo.—Street Commissioner J. C. Travilla proposes to build a new kind of street in the reconstruction of Goodfellow avenue from Roosevelt place to Natural Bridge road. The construction which the commissioner has evolved will be cheaper than telford pavement and at the same time is expected to give as good service. Instead of underlining the roadbed with rock, as in telford construction, rocks will be laid a few feet apart and the intervening space filled up with cinders. On top of the cinders will be placed ordinary macadam. At intervals of about every 100 feet extra precautions will be taken to insure perfect draining. The street commissioner estimates a good deal of money can be saved in the cheaper class of street improvements if the venture proves a success. For the work planned he has \$10,000.

Texas Towns Form Highway League

San Antonio, Tex.—In order to extend to the Rio Grande the proposed highway between Denver and San Antonio, much of which has been constructed, the San Antonio-Laredo Highway League has been formed, composed of delegates from all cities and towns along the line to be followed.

County Road Work Started

Colchester, Vt.—The town of Colchester has already commenced permanent highway improvement for the year under the supervision of the town commissioner, and County Supervisor Herald Stevens. Work is now going on upon the main road, and it is designed to improve this road from Winooski village line to the present rebuilt portion, so far as possible this season. Colchester is the first town in the county to start road work this season.

Road Work Still Delayed

Newton, N. J.—The Fidelity & Deposit Company of Maryland, surety for the contractors of the Stanhope-Newton macadam road, which has been nearly four years under construction, is endeavoring to secure the consent of the road committee of the Board of Freeholders to allow the thoroughfare to be completed under a separate contract, with the company's representatives as supervisors. Ward W. Pierson, of Philadelphia, of the legal staff of the bonding company, has been interviewing the officials in an effort to bring about that result. The county authorities thought that the road could be completed much more cheaply if a new contract was not entered into. The expense of getting the contract advertised, as well as the expense of having the county engineer prepare new specifications, is the argument they use. The road contractors threw up their job about a year ago and left the country. Since then nothing has been done toward completing the work.

SEWERAGE AND SANITATION

Begin Campaign Against Flies

Worcester, Mass.—A campaign of 10 days against the house fly in Worcester has been inaugurated under the direction of a committee consisting of Dr. Clifton F. Hodge, of Clark University, who planned the attack; Mayor David F. O'Connell, Executive Officer James C. Coffey, of the Board of Health; Superintendent of Schools Homer P. Lewis, and Mrs. George H. Savage, chairman of the civics department of the Worcester Woman's Club. The committee is to raise by subscription a fund from which will be paid a premium of 10 cents a hundred for all the flies killed before the campaign closes on May 28.

Forward Plea on Sewer Tank

Bloomfield, N. J.—Declaring that a sewage disposal plant for Orange, East Orange and Montclair, located at the boundary line of Belleville and Bloomfield, would damage those two places materially, and not merely in a sentimental way, leading citizens of Bloomfield have forwarded to the three municipalities an urgent appeal. They call attention to the fact that their position is tenable, for neither of the three would like to have the tables turned. They also disclaim responsibility for the basis of cost apportionment for the trunk sewer, which they recognize as the chief reason why the separate disposal plant was projected. Addressed to "Our Neighbors, the citizens of Orange, East Orange and Montclair," the appeal concludes as follows:

"We cannot join with you, because we cannot afford to risk our means in an enterprise where the method of operation is still an experiment in this country, and which in the end may prove far more expensive than any other plan suggested for the disposal of the sewage of these municipalities.

"We cannot join with you because we cannot be a party to the damage to our neighbors, Nutley and Belleville. The stream which for a mile or two courses through the very heart of Nutley will be swollen to three times its normal size by the effluent from the disposal works.

"We cannot join with you because we believe that the damage to our own territory would be greater than all the possible benefits to be derived.

"We place our position before you in the hope that, as neighbors, you will not do us a great wrong by inflicting this nuisance upon us in the face of our earnest protest."

Chattanooga Inaugurates War Against Mosquitoes

Chattanooga, Tenn.—An active war against mosquitoes has been begun by the city health commissioner acting in co-operation with the business leagues of the various suburbs. The heavy rains of this spring, which raised the Tennessee river to a higher level than in the past ten years, left ponds of standing water in a number of sections of the city, both business and residence, and for this reason the menace this year is greater than in the past decade. The winged pests will be fought by the application of oil to the various ponds. Steps will also be taken to drain the ponds in every point where it is possible. Because of the fact that railroad fills are responsible for the retention of a large amount of the water the various railroad officials have agreed to aid in the work.

Says Pittsburgh Smoke Is Not Unsanitary

Pittsburgh, Pa.—Prof. R. C. Benner, of the industrial research department of the University of Pittsburgh, in an address before the Oakland Board of Trade on May 14, stated that the soot of Pittsburgh was not unhealthy. He also stated that the efforts to prevent smoke in this city compared favorably with the same work being done in Cleveland and Cincinnati, and that the death rate here from the inhalation of coal gas was not large. In speaking of smoke prevention, Prof. Benner stated that the man behind the shovel, in the long run, was a much better fireman than the mechanical stoker, which he said was all right in many places, but not under all conditions. Those installed in the right places, he said, have saved, in fuel, their costs many times over. In speaking of the heating and puddling furnaces, which the law exempts from the smoke nuisance, Prof. Benner said that many were being fired in such a way as to prevent smoke and that more heat, because of the proper combustion of the fuel, was being obtained. The soot fall in Schenley Park, he stated, was between 9.789 and 12.566 pounds a square mile. This, said the speaker, was not large for an industrial center like Pittsburgh. The lecture was replete with interesting data regarding the damage to goods in stores and the decrease in skylight efficiency because of smoke.

WATER SUPPLY

Give Waterworks Value

Milwaukee, Wis.—The value of the Milwaukee water works is \$7,193,859.26, less \$12,780.16 depreciation, or \$7,181,079.10 net, according to the bulletin issued under the direction of Superintendent Hohmann.

Found Oil Instead of Water

Joliet, Ill.—An artesian well which has just been completed here, and which was counted on to produce a million gallons of water a day and recruit the municipal supply to such an extent that the water famine of the past three summers would not be repeated, has turned out to be an oil well. When the new pumping machinery was turned on a stream of pure shale oil instead of water burst forth. The oil is being pumped at the rate of thousands of gallons an hour. The well will be shut off when the engineers become convinced that the gusher is one of oil and not water. It will be turned on later and the product used to oil the streets during the summer.

Detroit May Be Short of Water

Detroit, Mich.—That Detroit will be short of water this summer in spite of the best that can be done, and that unless immediate steps are taken to extend the water works system, it will be but a few months when the city will be confronted with an absolute shortage, is the essence of an exhaustive report submitted to the water board by Professor Gardner S. Williams, consulting engineer of the University of Michigan. Professor Williams was employed by the board last March to make an examination of the city's water supply needs and also the cause of recent breaks in water mains. He will submit another special report on the subject, but in a general way he says the breaks were caused by an overloading of the intake pipe, the boilers, the engines and the mains. Professor Williams' recommendations include the construction of an additional intake pipe; three new high pressure engines for the pumping plant and several new water mains of large capacity. The estimated cost of the improvements is \$4,000,000.

Franklin Water Supply

Franklin, Tenn.—The water works system of Franklin has been tested to determine the purity of the supply. Every connection in the city was cut off during the test. The water was found to be excellent, and notwithstanding its cleanliness and freedom from all apparent impurities, every pipe, big and little, was flushed and thoroughly cleansed. Franklin's water supply comes from a range of fine springs in the hills many miles distant in the western part of the county. It is a gravity system.

Find Well Water Much Purer

Woodbury, N. J.—A peculiar situation was revealed at a special meeting of the council to hear the report of an expert as to the quality of water from a new well and that from the stream, the present source of supply. The latter had been doubly filtered, while that from the well was just as it was taken, and the council was startled when the report showed that the well water had a higher per cent. of purity. It was decided to call a public meeting to get an expression of opinion as to what shall be done.

New Water Works System Ready June 1

Las Cruces, N. M.—As a test of the new water works system the pumps of the city water works were started up pumping into the mains for the purpose of washing out the mains before pumping into the reservoir. Pumping into the reservoir will begin within a few days. The reservoir holds 80,000 gallons, in addition to which 6,000 gallons are held by a stand pipe. The water works will all be completed and turned over to the city by June 1. Chief Engineer Archer, of Kansas City, Mo., will arrive in a few days to see Resident Engineer Taylor and to see the severe tests which are to be made of all the works before they are accepted from the contractors.

Water Pumped in New Plant

Fargo, N. D.—The water is being pumped into the new filtration plant under the direction of City Engineer Anders and the expert operator, O. C. Ayliffe. So far as can be learned everything is working in a most satisfactory manner. All of the machinery has been placed in position and there are only some minor details to be attended to. The filtering sand is being placed in the filters and everything is being prepared for the start which will be made about June 1. It will be fully that time before the official testing will be commenced and this takes actually forty-five days, fifteen days of testing, fifteen of rest when the plant will be run automatically and then fifteen more days of testing, the testing being under the supervision of a Chicago expert.

City Reservoir Work Rushed

Fort Worth, Tex.—That approximately \$115,000 worth of work has been done on the city reservoir, which will be the storage basin of the water for the new city water works, was one of the statements made by Engineer Trammell at the meeting of the City Commission. He also said that work had been confined to the embankment operations and the excavations for masonry foundations. Satisfactory progress, he said, had been made in face of delays enforced by the rainy weather which has prevailed for several weeks past. The location of the reservoir is seven miles northwest of the city. Masonry work on the foundations of the reservoir will be commenced at an early date. The river, which has been above normal height for nearly three months, has interfered with the progress of the work. Efforts to carry off the excess of water by digging channels have not been successful and the water remains so high that progress on the masonry is hindered. Extensions have been made in the time limit by the contractors, and the Underground Construction Company believes the work will be delivered to the city by December 1. Construction work on the conduit line, or pipe line, from the filter plants to the city reservoir is making satisfactory progress also. About a mile of that has been laid. Night and day shifts are engaged in the making of that conduit pipe at the manufacturing plant on the Arlington Boulevard, near the Frisco tracks. From the filter plant to the settling reservoir the pipe will be thirty-six inches in diameter and the remainder of the line will be forty-eight inches in diameter. The pipe line will be laid by the time the reservoir is finished. The only business done by the commission was to allow the regular accounts.

Water Pressure Causes Fire Alarm

Janesville, Wis.—High water pressure in the city mains, applied for the purpose of filling the reservoir at the cemeteries, resulted in a false alarm being sent in from the Janesville Batting Mills. The sprinkler system at the batting mills has a "tell-tale" which is connected with a private alarm system running to the fire station. This was set in operation by the abnormal water pressure overbalancing the weight which holds down the valve.

Gary Mills Water Mains Stopped by Fish

Gary, Ind.—The steel mills were temporarily stopped last week by thousands of tiny fish. The intake pipes supplying the mills with water became clogged by the little fish, which had been driven to this end of Lake Michigan by the heavy sea. Three blast furnaces were shut down until the water pipes were closed. The mains were opened and found to be choked with a wriggling mass of fresh water herring. The fish were removed with shovels and the furnaces started again.

Condition of City Water

Council Bluffs, Ia.—The weekly report of the condition of the city water shows the total pumpage for the week to have been 17,625,714 gallons. The bacterial efficiency of treatment was 99.8 per cent. The presumptive test for coli showed all positive for raw river water and for settled water, while it was all negative for the treated water. Following is a statement of the bacteria per cubic centimeter, and also the turbidity on the average during the week:

Source.	Bacteria.	Turbidity.
Treated water	41	46
Settled water	1,456	....
Raw river water.....	32,000	3,500

Cost of Main Break \$12,000

Schenectady, N. Y.—The break in the 36-inch pipe in Rotterdam will cost the city approximately \$12,000. Superintendent of Water F. W. Bentley is now busy compiling the costs and will be in a position to report to the board of estimate and apportionment the exact amount early next week. Mr. Bentley is of the opinion the Delaware and Hudson Company, whose railroad tracks cross the 36-inch main at the point of the break, will reimburse the city for the expense it has been put to in making the repairs. The administration has taken the position that the big water main was broken by the weight of the earth filled in by the railroad in the building of its detour, the main being buried to a depth of about 40 feet. The railroad company has about completed the work of refilling the big hole excavated by the city at the time the break was repaired and embedded in concrete. It is expected the track will be relaid and traffic resumed next week.

STREET LIGHTING AND POWER

Will Celebrate Lighting of Street

Mt. Clemens, Mich.—As a result of many complaints that have been received about the insufficient illumination on New street, trenches are being dug preparatory to the installation of a new lighting system. Seven ornate standards, each with five clusters of lights, will be installed. The work will be complete in about a week. New street merchants are preparing to hold an opening night in celebration of the new fixtures.

Ornamental Lighting Favored by Merchants

Oswego, N. Y.—The Retail Merchants' Association has gone on record as favoring the placing of ornamental lights in the business sections of the city. Commissioner of Public Works John Smith explained the ornamental lighting system at Hartford, Conn., which he inspected at the request of the association. Mr. Smith stated that the Hartford system was less expensive than any in use in cities of the size of Oswego. He recommended the installation of a system similar to that in use in Hartford. The committee appointed to investigate the matter reported that the cost of installing the service would be about \$8,000. Mr. Smith said that the city would pay one-third of the cost. A committee was appointed to investigate the matter further. A committee was also appointed to co-operate with the Chamber of Commerce in arranging for the proposed celebration on July 4.

Cheaper Light for Northville

Northville, N. Y.—The Northville Electric Light Co., William Harris, proprietor, has been sold to the Broadalbin Electric Light & Power Co. The Northville company generates the current by steam, and current is only furnished from dusk until midnight, while the Broadalbin company's current is generated by water power and will be continuous. The Broadalbin company also agrees to furnish current much cheaper than the old company, and this, together with the continuous service, will, they think, induce many citizens to use the current who have not previously done so.

Difficulties in Lyons Lighting Situation

Lyons, N. Y.—Now that the people of Lyons have voted for municipal ownership of an electric lighting system, those back of the scheme are up against the proposition of disposing of the contract at \$7,000 per year running for five years, entered into by the Board of Village Trustees, May 5, 1911. This contract, the municipal ownership advocates say, is invalid. The Central New York Gas & Electric Company say it is as sound as a dollar. Further than that, the electric lighting people stand pat and refuse to stipulate a case for presentation to the courts for adjudication. They say they will furnish lights until May 5, 1916, and will then sue for their pay.

Searchlight Proposed for Catching Burglars

Indianapolis, Ind.—A new terror for Mr. Burglar and other criminals who pursue their professions at night will spring into existence, provided the Board of Public Safety establishes a watch tower, as contemplated, on top of the sixteen-story Merchants' National Bank building, now under construction. The new obstacles to a peaceful pursuit of their profession that criminals will have to face will be a powerful searchlight flashed from the proposed watch tower to every nook and corner of the city. The proposed tower is to take the place of the one on the court house, which is used exclusively for fire detection purposes. In the new location, which will be 17 by 17 feet and 295 feet above the sidewalk, it is proposed to have a policeman on duty at night, in addition to the fire watchman. The policeman would be one who has spent long years in service and knows every street in the city. Throughout the night this policeman would keep the searchlight sweeping over the city, watching for evildoers. If a report of a burglary came into police headquarters it would be telephoned at once to the tower man and he would send his searchlight flashing over the immediate vicinity of where the burglary was committed. If a murder was committed and the murderer escaped he would be sought with the searchlight.

FIRE AND POLICE

To Install Gongs for Warning

Chattanooga, Tenn.—Some adequate plan for clearing the business district streets in order that fire fighting apparatus may pass without delay or danger of accident will be devised and put into execution in Chattanooga. Constantly increasing traffic, and a few specific instances in recent weeks, show that such a step is necessary for best results. It is expected that a system of gongs will be installed, on Market street at least, to warn the traffic officers of the approach of fire companies. The plan is to have these gongs at intervals of a block, and loud enough to be heard that distance. They will be on a separate circuit from the regular fire alarm, to be sounded direct from the adjacent fire halls and only in case the company is called to such a point that it must pass along, or across, the crowded thoroughfares. The traffic officers thereby will be warned of the emergency and have time to clear the way of vehicles. At the regular meeting of captains of the fire department, May 6, this question was discussed. General Manager W. E. Boileau, of the Chattanooga Railway & Light Company was present, because of the co-operation of that concern needed to obtain the desired results where fire apparatus is compelled to traverse the downtown streets. Mr. Boileau promised such co-operation at any and all times, and indicated that employees would be given thorough instructions on the subject.

Firemen on Strike

Pittsburgh, Pa.—The firemen of New Kensington are on strike because some of the citizens of the borough closed one of the shows in their recent street carnival. The fire fighters did not, however, throw their hose and other apparatus through the windows of the engine house, as they had threatened to do. When the show was closed the men went to the engine house and posted a notice that they were through and would answer no more fire alarms. The apparatus is now at the disposal of the borough.

Houston Fire Loss \$1,000,000

Houston, Tex.—A recent fire in Houston's upper business district has caused a loss approximating \$1,000,000. Adjoining building took fire from the six-story Stowers building, in which the fire originated. The blaze spread across Capitol avenue to the Latham building and the Thomson building, the flames reaching to the upper floors of the ten-story Jones building, a fireproof structure, which was comparatively slightly damaged. The sixteen-story Carter building, a block distant, was blistered and the windows were broken by the heat. Defective wiring is blamed.

Auxiliary System Using Salt Water

San Francisco, Cal.—Salt water is now being used in the auxiliary high pressure fire protection system, but fresh water will be substituted as soon as the station on Ashbury Heights, through which water will be drawn from the Spring Valley system, is equipped and ready for operation. This will probably be in a few weeks, President Casey, of the Board of Public Works, says. The Twin Peaks reservoir is only partly filled, and will be kept so until fresh water is obtained. The high pressure system is so constructed that salt water, pumped from the bay, can be had to fill it through its entire length at all times, but the intention has been to use salt water only in cases of emergency or necessity for the reason that its constant employment would have an injurious effect on the pipes and other metal. Casey states that no harm will be done by keeping salt water in the system for a few weeks or months, while waiting for the fresh water equipment. Lately it was planned to fill the Twin Peaks reservoir and the available thirty miles of pipe with fresh water, and the City Engineer's office asked that a requisition for 20,000,000 gallons be made on Spring Valley. It was arranged to pump with a Fire Department engine from Lake Merced into the Twin Peaks reservoir, but soon it was found, Casey explained, that by this slow process it would take several weeks to fill the reservoir. It was then decided to take salt water, and the pumping station at Second and Townsend streets quickly provided all that was required. President Casey states that the more than thirty miles of pipe which are filled with salt water are now ready for use by the Fire Department, and that inside of a month twenty-five or thirty miles more of the system will be finished.

Commence Crusade to Cut Fire Loss

Cleveland, O.—A nation-wide campaign, which, it is hoped, will result in a reduction of the immense annual fire losses of the United States, will be begun in Cleveland. The Cleveland Chamber of Commerce will ask every city in the country with a population of 25,000 or over to work for a resolution, now pending in the National House of Representatives, calling for an investigation and compilation of fire insurance statistics. The board of directors of the chamber has authorized the fire insurance committee to send out circulars to other cities asking co-operation in trying to have the resolution passed. House resolution No. 357, the one under consideration, reads:

Resolved, That the Secretary of Commerce and Labor be directed, acting through the Bureau of Corporations, to make a complete investigation of the business of foreign and domestic fire insurance corporations in the United States, and to gather, compile, publish and supply in full, complete and useful information concerning the abnormal losses of life and property by fire in the United States, the proportion such losses of property, insured or uninsured, bears to the whole amount of property insured in the United States, the rates charged for fire insurance and the means and classifications employed in fixing the same, the reasonableness thereof, and their effect, if any, in causing or preventing such losses, and all other facts and information necessary to indicate means of preventing such losses of life and property.

AUTO APPARATUS NOTES

San Francisco May Fully Motorize Department in Four Years at Cost of \$1,000,000—Special Value of Autos in Hilly Cities—A Bad Accident

San Francisco, Cal.—The advisability of providing for motor-driven apparatus for the Fire Department was discussed at the meeting of the Finance Committee of the Supervisors, when the budget appropriation was under consideration. President Brandenstein, of the Fire Commission, said that to equip the department fully with motor apparatus would cost \$1,000,000. He thought that a bond issue for the purpose would not be necessary. He explained that the substitution of motor apparatus would have to be gradual, and the \$1,000,000 could not be properly expended in one year. It should be spread over three or four years, and he suggested that the Supervisors consider making appropriations in the next three or four annual budgets, so as gradually to provide the entire sum required. Brandenstein remarked that motor-driven apparatus was needed in San Francisco more than in other cities, as in his opinion it was more difficult to handle fires here than elsewhere because of the hills, high winds and the character of many of the buildings. It was important to put a fire out quickly here, and without motor apparatus it was hard to get to fires in many localities. Supervisor McCarthy said that he believed in using motor apparatus, but he did not think that such apparatus had reached a stage of perfection that would warrant the investment of \$1,000,000 in it at once. He thought that a moderate sum would be well spent, however, in starting on the motor equipment of the Fire Department.

Richmond, Ind.—The new automobile hook and ladder wagon of the city fire department killed one man and injured three others May 18, when it responded for the first time to an alarm of fire. Isaac Parry, sixty years old, a contracting plasterer, who was walking along North E street, was struck by the big machine when it skidded on the wet pavement, and his head was almost torn from his body. John Forbes was knocked out of a buggy and suffered a fractured collar bone and right forearm. Edward Miller, Chief of the Fire Department, fell from the truck when it struck a telephone pole and he was badly hurt. John Brushner, a fireman, escaped with minor injuries. The accident was witnessed by scores of persons and it is stated that the auto was running at a speed of more than forty miles an hour. The truck was badly damaged.

Dallas, Tex.—In a few years the automobile has come to occupy a distinctly useful position in the administration of city government and protection to its people, and Dallas is no exception, having fourteen gasoline-driven machines in use, two in the Police Department, seven in the Fire Department and others in various departments. More than \$50,000 has been spent for automobiles. The city now has a third automobile fire engine ordered and it is planned to transform the Fire Department, as nearly as the condition of the streets will allow, into a department equipped only with motor-driven fire fighting machines of the highest type. The use of the auto is also to be extended in the Police Department. Another auto patrol wagon is desired and several new motorcycles are to be added to the four already in use. Fire Chief H. F. Magee, who began fire fighting long before the auto was thought of even as a dream, but who is always on the outlook for means of improving his department, becomes enthusiastic when he is asked about the value of the automobile as a fire fighter. He points out that they save much money in cost of operating the department and that they are more reliable and far speedier than the old horse-drawn engine. "When you add the great speed of the automobile fire engine to the economy of operation, the auto is the only thing you can really afford to consider. Even if the cost were greater, the speed of the autos would make them cheaper in the long run, because they would save the public so much money. They keep in good shape with proper attention and a modern fire department must have them." Members of the police force are as enthusiastic. The driver of the patrol wagon points with pride to the engine of his machine and says that it has never been necessary to repair

it. And in the year that ended May 1 the machine made more than 8,000 trips. The motorcycle officers fly from one end of the city to the other, and the speedy little machines are as important in procuring police protection as the auto in fire protection. Other city officials use autos in their work and find their chief value in the saving of time and increasing the amount of work that can be done. The first auto to be put into use in Dallas was bought for Park Superintendent W. R. Tietze and he is still running it from one park to another. It cost about \$1,100 four years ago. The next car purchased by the city is also in use today. It is Fire Chief Magee's automobile, bought on July 10, 1909, at a cost of \$1,692. The third car purchased was a small machine for the use of the City Chemist, that cost about \$700 in October, 1909. That has worn out and has been replaced. An automobile fire engine pump was bought on June 28, 1910, cost \$8,250; the second engine, at the same cost, was bought on March 18, 1911; the third engine, at the same cost, was bought on February 2, 1912. An auto hook and ladder truck now on the way and due to arrive June 1, costing \$5,250, was recently purchased. A police patrol was purchased November 8, 1910, cost \$3,300. The Chief of Police has asked to purchase another. Automobiles have been purchased for and are in use by the City Engineer, Superintendent of Police and Fire Alarm, Chief of Police, Water Works Engineer and City Health officer.

Wilmington, Del.—In a test, the new automobile fire engine of the Fame Hose Company, of Wilmington, traveled at a rate of 38 miles an hour up a steep hill, carrying all equipment and ten men.

Indianapolis, Ind.—A new motor combination hose and chemical wagon has been received by the Board of Public Safety and will be placed in service at fire headquarters, while a similar piece of apparatus will be moved from headquarters to engine house No. 5 in Fifteenth street. A chemical wagon has been moved from engine house No. 5 to engine house No. 23, affording additional protection for North Indianapolis. Hose wagon No. 15, at engine house No. 5, will be held as reserve apparatus. The new apparatus received carries seven men, one thousand feet of water hose, a forty-gallon chemical tank, 250 feet of chemical hose and axes.

Herkimer, N. Y.—A new fire auto truck has arrived and been placed in the headquarters at the Municipal building. Previously to being placed in the quarters the truck was run about some of the principal streets in the village. The truck was brought from Utica in charge of Harry Vincent, Chief of the Fire Department, who was accompanied by a representative of the American-La France Company, of Elmira, the manufacturers, who will give instruction to a number of the firemen. There will be a public exhibition next week, when tests will be witnessed by fire and civic officials and other citizens from Oneonta, Rome, Little Falls, Ilion, Frankfort and Mohawk. It is planned to have a parade by the Fire Department on that date.



Courtesy Waterbury Republican.

WATERBURY CHEMICAL WRECKED IN A COLLISION.

GOVERNMENT AND FINANCE

Commission System Valid in Minnesota

St. Paul, N. Y.—The commission form of government for Minnesota cities is perfectly legal, and there is no clause in the State constitution which abridges in any manner the institution of the commission plan. This opinion of the State Supreme Court was given in a case wherein the validity of the Mankato commission government had been attacked.

Favors Accounting Plan Adopted by Eastern Cities

Indianapolis, Ind.—W. A. Dehority, Chief of the State Board of Accounts, has returned from ten days in New York and Washington, D. C., where a committee, of which he is a member, was preparing the draft of a report on uniform budgets for cities, to be made in the June meeting of the National Association of Accountants and Controllers.

One of the most important forward steps in public accounting found by him, Mr. Dehority said, was a system now used in Cleveland, O., and New York, which provides for a triplicate system of requisitions in the purchasing of public supplies. One copy is kept by the department making the requisition, another is kept by the auditing department, and the third goes to the firm from which the articles requisitioned are to be purchased. The operation of the plan in New York, where it is now being tried for the first year, is said already to have saved the city several millions of dollars, because of the prevention of duplication, padding claims, etc. Mr. Dehority has talked with the Marion county authorities concerning the adoption of some such plan here.

"In New York I saw advance payment with a vengeance," said Mr. Dehority. "The annual budget of New York runs about \$174,000,000. Every year the city anticipates its tax revenue and issues temporary bonds for current expenses. The aggregate of these bonds runs annually about \$120,000,000. Thus New York enters every fiscal year with virtually nothing in the treasury and borrows its spending money."

Polson Will Have Commission Form

Polson, Mont.—By a vote of 57 to 52 Polson, the young metropolis of the Flathead reservation country, adopted the commission form of city government at the special election. It is believed that Polson is the smallest town yet to attempt the new form. The plan was strenuously opposed by its opponents upon the argument that the salaries of the officials as fixed by law would exhaust the entire city revenue.

STREET CLEANING AND REFUSE DISPOSAL

Vacuum Street Cleaner Tried

York, Pa.—The vacuum cleaner idea has been applied to a street cleaning machine which is being tried out here by a local manufacturer. The apparatus consists of a high-power gasoline engine fastened upon a truck and with a rubber suction apparatus, which gathers in all loose dirt and dust.

Appleton Council to Favor Oiling Streets

Appleton, Wis.—An order has been placed by the City Commissioners for a carload of calcium chloride to be used this season for keeping down dust on mud streets that in former summers have been sprinkled with water. Calcium chloride was used in an experimental way here last summer. Twenty barrels of a certain kind of oil, made especially for the sprinkling of paved streets, have also been ordered and will be experimented with on one of the downtown blocks of College avenue.

City Gets Cash for Waste

Philadelphia, Pa.—There is considerable revenue to be derived for the city in the disposal of waste, which includes a variety of material that comes within this category, and Director Loeb has issued notices that all salable waste must be placed in bales and sold. During the month of April \$3,455 was realized from the sale of waste paper from the City Hall, barrels, boxes, carboys, fats, bones, cast-off clothing, old hose, rope, etc.

Children of Decatur Clean Up the Town

Decatur, Ga.—The pupils of the Decatur public schools have handed in 300 pledges from the citizens of Decatur to clean up and beautify their homes and property. This is a part of the Decatur cleaning up campaign, which has been carried on with remarkable success throughout the month of May by the town council and the Decatur Board of Trade. As a result of this campaign, stores and residences have been screened against flies and mosquitoes, thousands of bottles and cans, breeding places for mosquitoes, have been carted off, terraces sodded and fences painted. Dr. Wiley Ansley has had charge of the sanitary work carried out by the council and W. H. S. Hamilton has been largely responsible for the many improvements carried on in Decatur.

Distributes 50,000 "Clean City" Placards

St. Paul, Minn.—Fifty thousand small placards on which is printed city ordinance 853, regarding throwing or depositing dirt, filth and paper on or into any street, sidewalk, lane or alley or public ground of the city, and also the penalty for the violation of the ordinance, will be issued by the local division, St. Paul Association of Commerce, for distribution among the residences of the city. The placards will be placed in the hands of the city policemen, who will distribute them on their beats. Near the upper edge of the placard is printed in large type the words, "Clean Up Your Premises," and below in smaller letters, "Read the Ordinance." The ordinance follows in full. At the bottom of the card is printed the penalty for violation of the ordinance, which is punishable by a fine not exceeding \$50.

A. J. Krank, chairman of the local division, said that the movement is an attempt to reduce the city's expenses in keeping the streets and public grounds clean. He asserted that neither the street nor health department has sufficient funds to spend picking up refuse thrown into the gutters and alleys by careless persons. "It is a plan to reduce taxes," he said. "We will insist that the police department do its duty if the ordinance is violated. After receiving this warning contained on our placards there is no excuse for failing to observe it. The division intends to follow the matter up and see to it that needless littering of the streets and public grounds is discontinued."

Will Figure on New System for Collecting Refuse

Philadelphia, Pa.—An inspection of the street cleaning methods of Washington will be made by Director Cooke, Chief Connell, of the Highway Bureau, and Chief Neall, of the Division of Street Cleaning. Washington operates a number of machines, and is regarded as one of the clean cities. It also cares for household waste prior and during collection in an improved manner. Director Cooke is planning to inaugurate a system of the collection of waste paper by having the householder place this waste in bags, the contractor or purchaser of the waste being required to leave an empty bag when he takes away a full one. Denver operates this system successfully as well as some Eastern cities. "In Chicago they say that two men have acquired a fortune by collecting city waste in a cleanly manner," said Director Cooke. "I have so interested a paper dealer in the project that he has gone to Chicago to investigate the system. I want to get the dealers interested in the proposition, so that when collections begin on a large scale we can dispose of this waste. We must create a market for it. Some dealers buy waste paper abroad. Our plan is to work a district, one man agreeing to supply the bags as an experiment. If we find that the scheme will work out as we have planned we can establish it throughout the city. Then we will be prepared to state whether the city will pay for having the waste removed or the contractor pay for the privilege. This is one of the changes that we will make when the bids for street cleaning and removal of ashes and waste are received for next year. It is the purpose to get church people interested. The members of a congregation in one city, by handling household waste, succeeded in building a church. Others used the money for church work of varying descriptions. We want to get the church people interested in this cleanly manner of collecting waste, and they can gain money by selling waste."

Praise Cleanliness of St. Louis Streets

St. Louis, Mo.—That the streets of St. Louis are so clean a man could sleep in them without soiling his clothes is the opinion of a committee of Los Angeles officials, who recently made a tour of the United States. After completing the tour, Jesse B. Cook, president of the police commissioners, when he reached Los Angeles, said:

"A thing we noted particularly was the cleanliness of streets in some cities, especially in St. Louis. There all the streets, even along the levee, are so clean a man could sleep in them without soiling his clothes. They are flushed out with water every night." In the party were D. A. Worth, chief of police, and Lieut. Duncan Matheson.

Auto Garbage Carts Urged

New York, N. Y.—The removal of ashes and garbage by automobiles is the latest suggestion received by the Board of Estimate. The suggestion emanated from Mrs. Julius Henry Cohen, of the Women's Municipal League. The plan provides for standard, sealed receptacles for every householder. These, when filled, can be removed by Street Cleaning Department automobiles to the various dumps on the river front, and the contents deposited in sea-going scows. The receptacles, before they are returned to the individual owners, Mrs. Cohen urges, should be antiseptically cleaned. The plan was referred for consideration to a special committee, consisting of President Mitchel and Borough Presidents McAneny and Crowell.

Improved Street Cleaning Methods

Chattanooga, Tenn.—Decided reform and improvement is to mark the work of the street cleaners this and subsequent years, under administration of the Department of Streets and Sewers. Both in sanitary precautions and in promptness with which refuse will be removed from the districts where street sweeping is carried on, it is believed great improvement will be experienced this year. The department has ordered an automobile truck, which will have for its exclusive work the collection of refuse swept up by the white wings in the business district. This machine will have large capacity and do the work of several wagons. By its installation in the service, the cleanings will not have to lie for such long periods as before, but will be promptly shoveled into the wagon and hauled away. This measure will prevent in large degree the disagreeable, dangerous gathering of flies at refuse piles, and their subsequent dissemination of disease. Tarpaulins on scavenger wagons have made their appearance as one result of the ordinance passed by the municipal commission requiring covered receptacles and vehicles for storing and hauling refuse. This is an anti-fly measure and should add greatly to the comfort and health of the people, as well as remedy an objection to the appearance of city streets. Drivers of scavenger wagons will be required to keep as much of the refuse as possible covered while collecting from door to door along the streets, and entirely covered while traversing the distance from the end of their routes to the city dumps.

RAPID TRANSIT

Contemplate Building Municipal Railroad

Merrill, Wis.—This city will own and operate a municipal railroad if the recommendation of the Common Council and the proposed bond issue of \$200,000 is approved by the electorate. Declaring the transportation facilities have long been inadequate and that the progress and development of Merrill and Lincoln county have been greatly retarded by the lack of proper service, the city officials in a resolution have proposed a special election to submit the project to a vote of the people. It is planned to construct a line of standard gauge from Merrill west to the vicinity of Athens, a distance of twenty-three miles, where connection will be afforded with the Soo. Of the total cost, which has been estimated at \$200,000, Merrill will issue bonds for \$65,000 and the county for \$135,000. On the east an extension seventeen miles in length is proposed to the Langlade county line, where connection with the North-Western road will be established. The promoters are confident that as soon as the line is completed it will be purchased by interested companies and the construction fund returned to city and county.

P.A.Y.E. Cars for San Antonio

San Antonio, Tex.—"Have Your Exact Fare Ready." Every car carrying passengers for the San Antonio Traction Company will be labeled with the foregoing words within a few weeks, and beginning June 1 the pay-as-you-enter system will be inaugurated by the company. That was the decision of the officials after a conference with N. P. Hall, western representative of the Prepayment Car Sales Company of New York, who has been in the city arranging details for the installation of the system on the local street car lines. The inauguration of the P.-A.-Y.-E. system in San Antonio marks the conclusion of the Prepayment company's campaign to install their fare collecting plan in every city of the United States larger than 100,000. San Antonio is the last city of that size to adopt the system. The idea of passengers paying their fares as they entered the car and having the entrance closed and step folded before the car was put in motion originated several years ago and has passed through the experimental stage under the continuous test of the greatest cities of the country. With the experience gained on these greater systems the local traction company expects to place in service the most complete and practical operating device known. "There are at present more than 13,000 P.-A.-Y.-E. cars in operation in the United States," said Mr. Hall. "Of this number, not a line but has shown a great decrease in losses by accidents and a corresponding increase in dividends. In Washington, where practically the same type of service had been in operation as now exists in San Antonio, the loss was reduced in one year from \$1.97 per thousand passengers carried a mile to 13 cents. It was facts of that and similar nature which appealed to the San Antonio officials."

Boston's New Subway a Model

Boston, Mass.—The new \$10,000,000 Cambridge-Boston tunnel is in operation, and a trip that required from 25 to 35 minutes between New England's greatest metropolis and America's greatest university city will now be cut to eight minutes. The cars are all steel and nearly one-third longer than the standard subway car of Boston, New York and Philadelphia. They are capable of a speed of forty-five miles an hour. They are divided off into a large compartment for all passengers and a smaller one for smokers. The double tracks are safeguarded by automatic block signals throughout the entire three and one-quarter miles. The tunnels are ventilated both by induced and forced ventilation, and are remarkably free from the characteristic "subway atmosphere." The heavy-railed, rock-balasted tracks promote a smoothness of running. The cars can carry 75,000 passengers a day. The stations are finished in white tile and fitted with lavatories. Moving stairways are provided. For your nickel the company lowers you on a moving stairway into the tunnel at Park street, Boston, leaves you to walk a few feet to the nearest subway car, carries you three and one-quarter miles through an underground bore in eight minutes, tells you where to get off and almost pushes you on another escalator within a block of Harvard College. When a train comes in each car stops at a spot designated on the platform by a small signal lamp. Three doors are opened simultaneously on each side of the car on the pressure of a button in the motorman's booth. Three doors are closed and the train proceeds through the brilliantly lighted tunnel. Signal lamps flash by, changing from green to red, and before one has had time to be seated the cars are passing through what used to be the back parlor of an apartment house and out into daylight. A slight rise and the train booms over the Charles River and dives a second time beneath the surface to make the first stop at Kendall station. This is a repetition of the first station in tile finish, but has brown trimmings in signification of Brown University. Another start, a brief space of time and Central Square station is reached. Here the general plan is the same, the white tiling being trimmed with green for New England's second largest university, at Dartmouth. The train again closes its doors and reaches Harvard Square in four minutes more. This is said to be the most beautifully finished subway station on the continent. At this terminus is a distributing station, an improvement on those at Sullivan square and Dudley street, from which trolley lines radiate.

Snake Car, Boston's Latest

Boston, Mass.—The "Snake" car, a jointed coach, which, it is hoped, would be able to wind its way through the tortuous sharp turning streets of the downtown section, is being experimented with by the Boston elevated company in Roxbury. If it proves successful it will be introduced into the regular through city lines, enabling the company to run a 50-foot car where the regular large semi-convertible, prepayment cars cannot travel. This car is provided with a joint in the middle, a flexible platform covered with a hood and the car when on a straight away track appears as one unbroken length. Center doors are also provided and the passengers will enter and leave at that point. Two trolleys adorn the roof. The proper name for the affair is the Articulated car.

MISCELLANEOUS

Report of Municipal Employment Bureau

Tacoma, Wash.—During April 1,662 applications for work were made to the city's municipal employment bureau, and of this number 1,185 persons were given work, 47 of the number being women, according to the last report of F. H. Pettit, commissioner of the department of public safety.

City Is Advised to Use Motorcycles

San Francisco, Cal.—The number of horses and buggies used by the city departments is to be reduced. The substitution of auto runabouts for buggies in the Department of Electricity and in the Street Repair Department of the Board of Public Works has been approved by the Supplies Committee of the Supervisors and now the committee is considering the use of motorcycles. Richmond Tatham, of the police motorcycle detail, has submitted to the committee a statement as to the efficiency and economy of motorcycles. He says that the cost of running a horse and buggy is conservatively 6 cents per mile, while the expense of a motorcycle is only one-half cent per mile, and it can easily cover at least three times the distance a horse can go in a given space of time. Tatham says that the total cost of the three motorcycles in the Police Department was \$158.20 for 1911, including the cost of several new tires.

Wild Flowers to Beautify City Parks

Fort Worth, Tex.—Under the direction of Park Superintendent Vinnedge bushels of seeds from wild flowers will be gathered this spring and summer and later planted in the Fort Worth parks. He has discovered wild flowers in great profusion over the country that are native to this part of the world, and he proposes to beautify Fort Worth with them. At several of the parks half-acre tracts will be given over to these flowers. If Mr. Vinnedge carries out his plans special days may be named for the various flowers, following the custom that has been a great success in Kansas City. Mr. Vinnedge also hopes to secure Park Board control of the courthouse lawn, and if he does, wild flowers will be planted there. Plans have been completed for remodeling the horse fountain near the Texas and Pacific depot.

City Market Stalls Bring Record Prices

Denver, Colo.—All but nine of the 238 stalls at the municipal market have been disposed of for the season at auction. The bidding was the most spirited recorded at any of the annual sales, and the average price brought for stalls was the best in the history of the market. This market is situated along the west bank of Cherry Creek, between West Colfax avenue and Champa street, and is operated by the city. The stalls are used by growers of produce and commission men to display their goods, which are sold at both retail and wholesale. The market season opens May 1 and lasts for about six months, and the stalls are rented at so much per month to the highest bidder for each stall, at the annual auction. Stalls brought this year from \$3 to \$9 per month, or an average of about \$6.25 per month. The price paid is based on the location of the stall. After paying the salaries of the market master and his assistant the receipts from rentals go into the city general fund. The market is considerable of a moneymaker for the city and it is an important distributing point for fresh vegetables, fruit and other produce from the country.

City Has Roof Garden Park

Fort Worth, Tex.—Through the efforts of Miss Eula Roquemore, stenographer in the office of the City Engineering Department, a new park has been established. It is known as the City Hall Roof Garden. On the second floor of the building is a court fourteen feet square, and Miss Roquemore conceived the idea of making it a flower garden. She has divided off four small divisions, and each is well filled with plants and flower seeds. The little walks between are being filled with gravel.

Children Receive Flowering Plants as Awards

Richmond, Ind.—Flowering plants were awarded more than 2,000 school children for their energies in connection with the annual "cleaning up" day, which was recently held. The awards went to school children who devoted at least three and one-half hours to work at their homes, cleaning yards or working at flower beds. Each child also was made a member of the local league which is leading in the work of cleaning the city. Hundreds of loads of debris were taken from alleys by street cleaning forces.

New Flanders "20" for Health Board

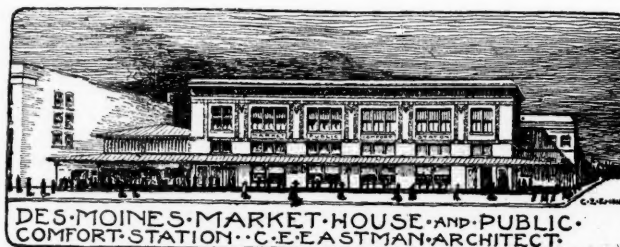
Lynn, Mass.—The city has received its third Studebaker car in the new Flanders "20" model purchased by the Municipal Council for the chairman of the Board of Health, through Elmer E. Bray, of 110 Central avenue, the local agent of the motor car company. Chairman Ward's handsome new vehicle is a 20-horsepower touring car, fully equipped and warranted for service. Experience with the cars used by the city engineer and the city electrician resulted in the placing of the order for this Board of Health machine. The new one is similar to the car that made the cross-continent trip to Hazleton, B. C., and is a model that has proved its good qualities very thoroughly. Both the cars from the Studebaker people now in the city's possession have given complete satisfaction to the officials whose uses they serve.

City to Operate Dairy

Kansas City, Mo.—A municipally operated modern dairy, under the direction of the park board, will be constructed in Swope Park, Kansas City's 1,300-acre playground, if the plans announced by Henry G. Ashley, president of the board, materialize. A resolution favoring the enterprise was adopted by the board. The aim is to set a sanitary standard for other dairies. Pure milk also will be sold at a low price to the Swope social settlement in the tenement district, where hundreds of babies are cared for during the summer.

Begin Work on City Pier

West Palm Beach, Fla.—Work on the new city pier has been commenced. The contract is let to the Southern Bridge Co., of Birmingham, Ala., whose local manager is W. E. Watson. The new dock, which is to cost \$8,000, will be of concrete arches, except for the first hundred feet, which will be made of wood. The reason for this is that it is expected sooner or later that the lake front will be filled in for this distance from the shore, when the wooden structure can be taken away. The length of the dock will be about four hundred feet. The first thing to be done is to remove the old dock, which is being done, the piles being taken out after the removal of the flooring, by means of a steam pile driver. The new dock will extend into the water a little further than did the old structure, and at the end will be a large bulkhead. The wharf will be of solid concrete, with arches which will allow the water to pass through and prevent any accumulation. It will require two or three months to construct. The Southern Bridge Co. was the builder of the Royal Park bridge.



DES MOINES MARKET HOUSE AND PUBLIC COMFORT STATION. C. E. EASTMAN ARCHITECT.

LEGAL NEWS

A Summary and Notes of Recent Decisions—Rulings of Interest to Municipalities**International Ferries—Municipal Regulation**

International Transit Co. v. City of Sault Ste. Marie et al.—A city, by virtue of its charter powers derived from the State, has no right to exact a license fee from a citizen of a foreign country for the privilege of operating ferryboats, situs of which is in such foreign country, engaged in the ferriage of passengers and property from a private wharf across an international boundary river to a landing on the opposite shore.—United States District Court, 194 F. R., 522.

Water Works—Injunction—State Statutes

Des Moines Water Co. v. City of Des Moines et al.—A federal District Court will not temporarily enjoin proceedings under an appointment by the State Supreme Court of appraisers in proceedings by a city to condemn a water works plant, on the ground that an act authorizing the appointment is unconstitutional, where the State Supreme Court has not passed upon the validity of the act, except by acting under it, where there is a conflict in authority on the question involved, and the State Supreme Court could find ground sustaining the act.—United States District Court, 194 F. R., 557.

Burgess—Ouster from Office

Commonwealth ex rel. Blakeley, District Attorney, v. Egan.—Where a burgess of a borough was a stockholder of a corporation when it sold supplies to the borough, he would be ousted, under Act May 28, 1907, though he had no knowledge of the sales until warrants were issued for the same and he indorsed such warrants as president of the corporation.—Supreme Court of Pennsylvania, 82 A. R., 1098.

Vacation of Streets—Rights of Abutters

Park City Yacht Club v. City of Bridgeport.—Ordinarily vacation of part of a street does not entitle an owner fronting on another part of the street to recover therefor, though the vacation causes some inconvenience to his access or compels a more circuitous route, or a diversion of travel in front of his premises and the consequent diminution of value, but an owner is entitled to damages where there is a practical discontinuance of a highway in front of his premises.—Supreme Court of Errors of Connecticut, 82 A. R., 1035.

Municipal Indebtedness—Limitation

Schuldice v. City of Pittsburgh et al.—In determining the limitation of indebtedness of a municipality, not requiring the assent of the electors, indebtedness existing before the adoption of the Constitution of 1874, including refunding bonds issued since that time to take the place of bonds then outstanding, and bonds and cash paid into the municipal sinking funds under statutory authority, should be excluded.—Supreme Court of Pennsylvania, 82 A. R., 1125.

Defective Sidewalks—Liability

City of Lexington v. Cooper.—When a sidewalk was built, there was left between it and the curbing a strip of ground on which grass and trees were growing. A semi-circular niche was made in the sidewalk around the trees. Later one of the trees fell and was removed, the niche being filled with dirt, grassed over, but leaving the surface about 2¼ inches below the level of the sidewalk. Held that, as a matter of law, this manner of constructing the sidewalk was not negligent; and hence the city was not liable for personal injuries caused by a pedestrian stepping into the niche.—Court of Appeals of Kentucky, 145 S. W. R., 1127.

Public Improvements—Damages

Schmidt v. City of Milwaukee.—The damages recoverable by abutting owner for a change of a street grade is the depreciation of value; and the cost of restoration is not the measure of this depreciation, but merely an element, since to adopt it as the measure of damages would entitle the lot owner to recover without any offset of benefits.—Supreme Court of Wisconsin, 135 N. W. R., 883.

Defect in Street at Railroad Crossing—Matters at Issue

City of Bloomington v. Chicago, I. & L. R. Co.—Where a city was sued by a pedestrian for injuries caused by a defect in a street at a railroad crossing, and the railroad company, though notified to come in and defend, failed to do so, the judgment therein was conclusive, in a subsequent action by the city against the railroad company to recover the amount it was compelled to pay, of the existence of the defect, the liability of the city to the injured party, and the amount it was forced to pay.—Appellate Court of Indiana, 98 N. E. R., 188.

Defective Sidewalk—Admission of Testimony

Lacoste v. City of Kenosha.—In an action against a city for death of a pedestrian, caused by an insufficient sidewalk, error in receiving evidence of an admission by the mayor after the accident that he knew the sidewalk was dangerous was harmless, where the jury were subsequently instructed to disregard such evidence, and where by independent evidence the jury were fully informed as to the situation of the place at the time of the accident.—Supreme Court of Wisconsin, 135 N. W. R., 843.

Policemen's Salaries—Construction of Ordinance

Laughlin v. City of Joplin.—An ordinance of a city providing that the policemen shall receive \$65 per month for the first six months' services, and, when a policeman has been in the service for six months, he shall receive \$70 per month for the next six months, and, when he has been in the employment of the city for more than one year as a policeman, he shall receive \$75 per month, is unambiguous and is prospective only, and one who has been a police officer for more than a year prior to the adoption of the ordinance, and who thereafter re-enters the service, is not entitled to compensation at \$75 per month, and the mere fact that the city gave such compensation to another policeman who had served for more than a year prior to the adoption of the ordinance does not create a contract entitling the former policeman to such additional compensation.—Springfield (Mo.) Court of Appeals, 142 S. W. R., 786.

Telephone Franchise—Interstate and Local Business

City of Pomona et al., Appts., v. Sunset Telephone & Telegraph Company.—A contract right to maintain only through interstate telephone wires in the city streets, and not to maintain the poles and wires connecting local subscribers, is all that can be gathered from the exceptions in favor of "telephone lines doing interstate business, made by Cal. act of March 22, 1905, which repealed, before it took effect, the act of March 20, 1905, so as to include telephone companies among the corporations which could occupy the city streets without municipal consent.—32 S. C. R., 477.

Defective Streets—Contributory Negligence

Ovens v. City of Charlotte.—Plaintiff was injured by driving his carriage against the stump of a tree, near the edge of a driveway 68 feet wide. Plaintiff had often seen the stump before, and testified that if he had been thinking of the stump he could easily have avoided it, and if he had driven in or near the middle of the street, and not at the extreme side, he would not have struck the stump. Held, that plaintiff was negligent as a matter of law and could not recover.—Supreme Court of North Carolina, 74 S. E. R., 748.

Water Company—Contract—Construction.

Birmingham Water Works Co. v. City of Birmingham.—A private water company, in consideration of a franchise, contracted to furnish water sufficient for the uses of the city and its inhabitants. It was also agreed that, in addition to the machinery then in use, there should be another station established, capable of delivering not less than 5,000,000 gallons daily into the city, and that, in addition to the reservoir then in use, another reservoir should be constructed. Held that, the contract having provided that it should run for 30 years, the provisions as to the facilities required were temporary, and not qualifications of defendant's general duty to serve as the exigencies of the future might require, and that it was bound to install facilities to supply an elevated district, which had become populated through the growth of the city.—Supreme Court of Alabama, 58 S. R., 203.

NEWS OF THE SOCIETIES

American Water Works Association

The program of the thirty-second annual convention, Louisville, June 3-8, follows: Headquarters, Seelbach Hotel; secretary's office, assembly room, and exhibits on the tenth floor. The office of the secretary will be open at 8 a. m. Monday, June 3.

Monday, June 3, 1912

Meetings of committees at call of chairman. Executive Committee at 2 p. m. Evening, 8 o'clock. Reception by Engineers' and Architects' Club, of Louisville, in the red room and leather room of the Seelbach.

Tuesday, June 4, 1912

Forenoon session, 9 o'clock. Regular order of business—Calling of roll, reading of minutes, election of members, president's address. Reports—Executive Committee, secretary-treasurer, Finance Committee, Publication Committee. Reports of standing and special committees—Committee on Electrolysis, Fire Protection Committee, Water Works Standards Committee, Special Committee on Revision of Standard Specifications, for Cast Iron Pipe and Specials, Standard Specifications for Wrought Iron Pipe, Uniform Annual Reports and Accounts, Depreciation, Special Committee on National Bureau or Department of Health, Permanent Headquarters, Incorporation of Association, Revision of Constitution, reading of papers. Afternoon session, 2 o'clock. Carriages will leave Seelbach Hotel, conveying the delegates and guests direct to the river pumping station, returning through Cherokee Park and the residential portion of the city to the hotel about 6 o'clock p. m. Evening session, 8 o'clock. Reading of papers—Ancient and Modern Water Works, Edward Wegman; Floor Area Unit as a Basis for Estimating Consumption, William W. Brush, illustrated by lantern slides.

Wednesday, June 5, 1912

Forenoon session, 9 o'clock. Question box—Reading questions and written answers, and verbal discussions of them. Experience meeting—Ice Troubles at Buffalo, N. Y., Henry W. Lyon; A Method of Increasing Depth of Large Wooden Settling Tank, A. H. Meyers; How We Crossed Two Streams with Ward Pipe at Rome, Ga., M. L. Worrell; also other "practical" papers and exchange of experiences. Eleven o'clock. Special order—Election of officers for 1912-13, selection of place for holding 1913 convention. Afternoon session, 1.30 p. m. Reading of papers—More Than Fifty Years' Reminiscence in Water Works, H. G. H. Tarr; Progress of the Adoption of the National Standard Hose Coupling and Hydrant Outlet, F. M. Griswold; Organization of the Bureau of Water Supply of the City of New York, I. M. de Varona; Philosophy of Purchasing Supplies, Elihu Cunyngnam Church; Efficient Management, Harrington Emerson. Evening—At Fontaine Ferry, as guests of the Water Works Manufacturers' Association, where members will join the ladies for dinner at 7 o'clock.

Thursday, June 6, 1912

Forenoon session, 9 o'clock. Reading of papers—Steam Turbines and Centrifugal Pumps, W. O. Berg; The Cost of Water, or Is It Worth While to Stop Wates, Edward S. Cole;

Method and Cost of Locating, Measuring and Repairing Leaks in Distribution System at Lancaster, Pa., F. H. Shaw; Results of Chlorination at Cleveland, O., D. D. Jackson; Hypochlorite Sterilization at Kansas City, Mo., S. Y. High. Afternoon session, 1 o'clock. The Louisville Water Co. will provide cars, leaving Fifth and Walnut streets—one block from hotel—to Crescent Hill filtration plant, where a real Kentucky burgoo luncheon will be served. Cars will be provided for the return trip to the hotel in time for the ladies' card party and the afternoon session of the convention at 3.30 p. m. Luncheon will be served at the plant, and everyone will want their appetite, so the business of the forenoon will be continued until car time. Seven o'clock. Reading of papers—Water Softening at Owensboro, Ky., E. H. Breidenbach; Electrolysis from Stray Railway Currents, Prof. Albert F. Ganz; illustrated by lantern slides. Evening session, 10 o'clock. "Stag party" with entertainment in the rathskeller, Seelbach Hotel.

Friday, June 7, 1912

Forenoon session, 9 o'clock. Reading of papers—To What Degree Must Sewage Be Purified? Chester G. Wigley; A Reliable Quantitative Test for B. Coli, Shepperd T. Powell; Currents in Tropical Lakes, John R. Downes; Wood Stave Water Conduit at Atlantic City, N. J., L. Van Gilder; What Is a Fair Rate for Cities, Alexander Potter. Afternoon session, 1.30 o'clock. Unfinished business, reading of papers not on program, general discussion of water works subjects, installation of officers for 1912-13.

The following questions have been proposed for the question box for this year:

No. 1. Is municipal ownership a success?

No. 2. Do street car companies do any street sprinkling in your city? If so, from what source do they procure their supply of water, and, if furnished by the water department or company, how is it supplied and what charge is made?

No. 3. Is the purchase of coal by B. t. u. preferable to purchase by weight? If so, what is the cost of apparatus for making test, or of test by chemist?

No. 4. Is it considered practicable to use incineration plant in connection with steam power pumping station for the disposal of garbage?

No. 5. Would there be any advantage in placing an air pump on a water line at the top of a hill, 180 feet or more above the pumping station, one mile from the pumps and two miles from the discharge end of the main, which is lower than the pump?

Note—The propounder of this question suggests that an automatic air valve did not give the necessary relief.

No. 6. What action do you take, at the time of fire, to regulate or control large private fire services, after the fire department is in service at the fire?

No. 7. Have you had experience with crippling of service at fires, owing to breakage of large private fire service, caused by the fall of buildings or other result of the fire?

Effect of Cold Weather

No. 8. To what depth did the frost

penetrate during the extreme cold weather of the past winter?

No. 9. How much below ordinary depth did the frost penetrate?

No. 10. Were any water mains in the "gridiron system" of the distribution, having a circulation, i. e., mains other than dead ends, frozen?

No. 11. What, if any, means are used to prevent the freezing of mains, hydrants and services, during the extreme cold weather?

No. 12. What action was taken when mains were frozen?

No. 13. What action was taken when hydrants or hydrant laterals were frozen?

No. 14. What action was taken when service pipes were frozen?

No. 15. Did frozen mains burst from expansion of water on freezing?

No. 16. Did frozen services burst from expansion of water freezing?

Note—Give specific information in replies to questions 15 and 16. It would be interesting to know, in case mains were frozen, whether considerable length of the main burst, or whether the breaking of one section, in a long line of frozen main, gave sufficient relief to protect the balance of the line where frozen.

No. 17. What effect did material of services have on the action of frost?

Note—That is, what material showed least or greatest injury from effect of freezing?

No. 18. What was the effect of cold weather on water consumption, or how much, or what per cent. above normal consumption was "wasted" to prevent service or house pipes from freezing?

No. 19. Was water "wasted" to prevent freezing of hydrants, hydrant connections, public fountains or fountain connections?

No. 20. What means were adopted to check "cold weather waste" of water?

No. 21. To what extent did this "waste" of water occur in metered services?

No. 22. How many meters were lost or damaged by freezing during last winter?

No. 23. What is the system of setting meters?

No. 24. What special precaution or action was taken to prevent freezing of meters?

No. 25. Was the consumer or department or company held responsible for damage to meters by freezing?

No. 26. What has been your experience concerning damage caused by bursting mains or services? Has water department or company been held financially responsible for such damage?

No. 27. What charge is made for private fire service?

No. 28. How are these services controlled or regulated?

No. 29. What is the effect of "local" water works associations on the American association? Do the "local" associations fill every want, and so discourage the American association, or do they stimulate the desire for greater and broader association and information, helping the growth of the larger association?

No. 30. Would it be feasible to submerge to the depth of about 40 feet a 24-inch cast iron conduit, working under maximum pressure of 50 pounds, laid with class "A" pipe and provided with non-automatic air cocks, masonry stop valve chambers, blow offs, etc.? What general precautions should be taken before the line is submerged?

American Road Builders' Association

The American Road Builders' Association will give a dinner at the Hotel Astor, New York City, at 7 o'clock Wednesday evening, June 5, in honor of W. Rees Jeffreys, Esq., secretary of the Road Board of England and Honorary General Secretary of the Local Organizing Committee of the Third International Road Congress to be held in London in June, 1913.

Mr. Jeffreys is coming to America to arouse interest in the London Road Congress. As this is the first International Road Congress to be held in an English-speaking country, it is hoped that it will be heartily supported by road builders and others interested in highway improvement in America.

Municipal Government Association of New York State

A symposium of mayors and corporation counsels on the question of home rule has been started by the recent circular letter of Mayor John K. Sague, of Poughkeepsie. This letter was sent to all cities of the State, enclosing a copy of the proposed home rule constitutional amendment introduced in the last legislature by Senator Burd, of Buffalo, together with an outline of the home rule programme advocated by the Municipal Government Association, of which Mayor Sague is president. This programme includes a municipal enabling act, to confer upon every city in general terms such general powers over its own affairs as the city ought to have.

Criticisms of the form of the Burd constitutional home rule amendment offered by various of Mayor Sague's correspondents will be taken up by the Municipal Government Association with a view to improving the amendment, if possible, before the next session of the legislature.

Mayor A. G. Senecal, of Plattsburgh, writes:

"I am heartily in favor of this amendment proposed, having for over two years been hampered by outgrown provisions of a charter more fitted for a small village. If the cities of the State are not competent to manage their own affairs without asking the legislature each year for further powers, perhaps in some minor matter, it would be better to be governed wholly from Albany.

"It seems to me to be a wise move to have the electors vote on any amendment to a city charter, as by that means the officials can discover whether their actions meet with the approval of the citizens.

"Any assistance which I can render in this work I shall be glad to furnish." Corporation Counsel Myron S. Short, of Lackawanna, writes:

"I have examined the proposed amendment and am heartily in sympathy with its provisions. I do not feel that I can make any criticisms on it or offer any suggestions for its amendment.

"I feel that it is quite impossible, under existing statutes, to conduct the affairs of any city without a great deal of trouble and red tape, which necessarily impede and hinder municipal progress and development.

"I shall be only too glad to do anything in my power to aid you in securing this much-needed reform."

City Judge John C. Bostelman, of Corning, writes:

"I believe a general bill governing

cities of third class would be a God-send. I am too busy at this moment to write you my complete ideas, and courtesy prompts me to acknowledge the receipt of your letter at the present time."

Mayor Louis Van Hoesen, of Hudson, writes:

"I have examined the constitutional amendment received and am heartily in favor of its adoption. This amendment will place the control of local affairs of a city in the hands of men who are acquainted with local conditions, which is certainly the most desirable method of securing satisfactory administration of local affairs of our cities.

"I would deem it advisable to restrict to some extent the right to issue bonds by providing, if possible, that any amendment to a local charter which provides for the issue of bonds shall be adopted by a majority vote of all persons whose names appear upon the assessment roll."

International Association Municipal Electricians

The 17th annual convention of the International Association of Municipal Electricians will be held at Peoria, Ill., August 26-30, 1912. The Jefferson Hotel has been selected as official headquarters for the business session and exhibits. Ample space will be provided for those wishing to exhibit electrical material and devices. Those desiring exhibit space will communicate with W. E. Walgamott, City Electrician, Peoria, Ill. Some very interesting papers are now being prepared for this convention, covering subjects of importance to the municipal electricians and others interested in electrical affairs. Clarence R. George, Houston, Tex., is secretary.

Calendar of Meetings

June 3-5.
American Water Works Association.—Annual Convention, Louisville, Ky.—John M. Diven, Secretary, Troy, N. Y.

June 4-6.
Michigan State Firemen's Association.—Thirty-eighth Annual Convention, Kalamazoo, Mich.—A. P. Lane, Secretary, Ithaca, Mich.

June 11-12.
Police Chiefs and City Marshals' Association of Texas.—Convention, San Angelo, Tex.

June 10-12.
Mayors Conference of New York.—Third Annual Meeting, Utica, June 10-12.—Mayor C. C. Duryee, President, Schenectady, N. Y.—Wm. P. Capes, Secretary, New York.

June 10-14.
National Electric Light Association.—Annual Meeting, Seattle, Wash.—T. C. Martin, Secretary, 29 West 39th street, New York City.

June 12-14.
Maryland State Firemen's Association.—Twentieth Annual Convention.—Edward Stevenson, Secretary, Lonaconing, Md.

June 17-22.
South Dakota Firemen's Association.—Twenty-eighth Annual Tournament and Convention.—M. H. Mussman, Secretary, Chamberlain, S. Dak.

June 18-20.
Georgia Association of Fire Chiefs.—Annual Convention, Americus, Ga.

June 19-21.
Wisconsin State Firemen's Association.—Annual Convention and Tournament, Reedsburg, Wis.—Fred H. Henry, Secretary, Jefferson, Wis.

June 20-21.
New York State Association of Fire Chiefs.—Annual Convention, Albany, N. Y.—U. G. Lucas, Secretary, Poughkeepsie, N. Y.

June 25-27.
South Carolina State Firemen's Association.—Eighth Annual Convention and Tournament, Rock Hill, S. C.

June 25-28.
American Institute of Electrical Engineers.—Annual Convention, Boston, Mass.—F. L. Hutchison, 33 West 39th St., New York.

June 26-28.
Society for the Promotion of Engineering Education.—Annual Meeting, Boston, Mass.—H. H. Norris, Secretary, Cornell University, Ithaca, N. Y.

July 8-12.
National Municipal League.—Annual Meeting, Los Angeles, Cal.—Clinton Rogers Woodruff, Secretary, 705 North American Building, Philadelphia, Pa.

July 9-13.
International Association of Chiefs of Police.—Annual Convention, Toronto, Ont.—Major Richard Sylvester, Superintendent of Police, Washington, D. C., President.

September 10-12.
International Association of Fire Engineers.—Annual Convention, Denver, Col.—James McFall, Secretary, Roanoke, Va.

September 18-19.
New England Water Works Association.—Thirty-first Annual Convention, Washington, D. C.—Willard Kent, Secretary.—Headquarters, Boston, Mass.

September 24-26.
Central States Water Works Association.—Sixteenth Annual Convention, Detroit, Mich.—R. P. Bricker, Secretary, Shelby, O.

November 12-15.
American Society of Municipal Improvements.—Annual Convention, Dallas, Tex.—A. Prescott Folwell, Secretary, 50 Union Square, New York.

PERSONALS

BILADEAU, JOSEPH F., Pittsfield, Mass., has resigned as Superintendent of the Waterworks, after a service of 25 years.

CLARK, Dr. S. W., Oskaloosa, Ia., has been appointed Health Officer of Oskaloosa, succeeding Dr. J. E. Morgan, resigned.

CUTTING, GEORGE W., Jr., Consulting Engineer, Boston, Mass., has moved his office from 6 Beacon street to 85 Water street.

MCCARTEN, THOMAS, Niagara-on-the-Lake, N. Y., has been appointed Chief of Police.

NICHOLSON, W. D., Jackson, Ga., has resigned his position as Superintendent of the City Water and Light Plant.

PETERS, MAGNUS, Orland, Cal., has been appointed Chief of the Fire Department.

SCHLOSSER, FRED., Brockport, N. Y., has been elected Chief of the Fire Department.

SHANLEY, FRANK, Rome, N. Y., has been appointed a member of the Board of Fire and Police Commissioners.

SOLLER, W. H., Youngstown, O., Chief of the Fire Department, has been appointed a delegate to attend the annual International Congress of Firemen at St. Petersburg. Chief Loller is president of the International Firemen's Association.

STEPHENS, H. M., Spokane, Wash., has been named Corporation Counsel by the City Commissioners.

STOCKLE, W. W., Hancock, Mich., City Engineer, has been appointed First Municipal Manager of Hancock.

The following Mayors have been elected:

COLORADO.

Denver—Henry J. Arnold.

MISSISSIPPI.

Sumrall—T. S. Williamson.

MUNICIPAL APPLIANCES

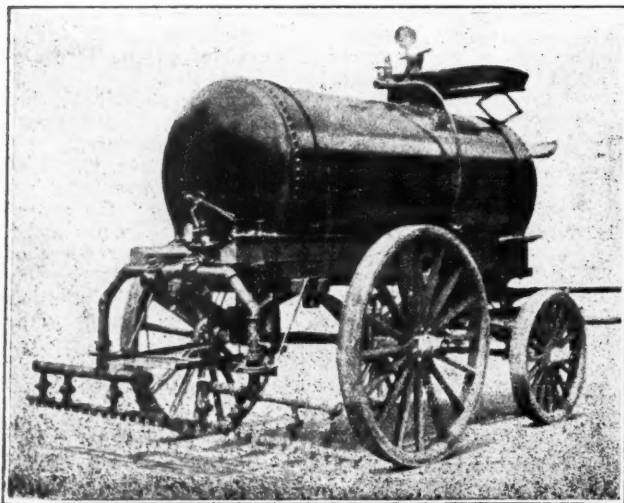
Pillsbury Sprayer

The Pillsbury Sprayer for distributing hot bitumens in road construction consists of a detachable spraying device connected at the rear of a steel tank wagon. The tank is mounted on spring platform gear, fitted with pole whiffletrees and neckyoke. The tires are six inches wide, to prevent the wheels from cutting into the broken stone of the roadway in new construction. The capacity of the tank is 630 gallons, and it is tested to stand a pressure of 100 pounds. The tank contains steam coils of sufficient radiating surface to heat the bitumen when steam from a roller or other convenient source is turned into them. The bitumen is kept under constant pressure by steam let directly into the tank from a roller or otherwise. If preferred, compressed air may be used for the same purpose. A safety valve prevents the pressure from rising beyond any desired maximum. The pressure in the tank regulates in part the amount of bitumen discharged. A quick-acting control valve and the speed at which the sprayer is drawn are the other factors in controlling the distribution.

In the spraying device and piping there is a connection back of the control valve into which steam may be turned to clean out every nipple of the sprayer. As stated, the sprayer is detachable. The piping is so simple that a glance at the illustration is all that is necessary to explain it. A complication of piping would permit the bitumen to get cold and clog. Two simple accessories are necessary to the operation of the outfit: A strainer through which the liquid bitumen passes in charging the tank, and a thermometer in the rear to indicate the temperature. As it is always necessary to have a steam roller on the job to roll the stone, steam for supplying the pressure is always conveniently at hand. The time necessary to bring the pressure up to the desired point is inconsiderable—ten or fifteen minutes.

The Pillsbury machine will spread any grade of tar or asphalt. For Bermudez asphalt a special nozzle and the use of compressed air is advised.

The machine is manufactured by Walter Cressey, Gloucester, Mass.



PILLSBURY SPRAYER FOR TAR AND ASPHALTS.

New Ransome Mixers

The Ransome Concrete Machinery Co., Dunellen, N. J., have just put on the market two new street mixers, the No. 60 and No. 61. The No. 60 machine is a steam-driven outfit capable of handling 14 cubic feet of loose material, regularly furnished with 10-foot distributing chute, and will mix 40 to 60 batches per hour, depending upon the speed at which the material can be fed to the pivot hopper. The engine is 8 horse power and the boiler 9 horse power. The machine is arranged to drive in both directions along the work.

The various levers controlling the operations of hoisting, discharging and traction are all brought to one point and the entire operation can be controlled by the engineer. The chute swings through an arc of approximately 180°, while the discharge point is 3 ft. 7 in. above the street level. The outfit is mounted on 24 and 28-in. wheels, with 10-in. tires. The net weight of the machine complete with power is approximately 11,000 lbs.

The No. 61 Ransome street mixer, shown in the illustration, will handle up to 20 cubic feet of loose material and will mix from 40 to 60 batches per hour. It is regularly equipped with a 2-cylinder opposed gasoline engine and a 20-ft. distributing chute. It is arranged with a clutch by which the drum can be thrown out and remain idle while the machine is traveling along the road, and it is also equipped with a traction device adapted for moving in either direction. A notable feature of this outfit is the fact that the over-all height has been kept within 11 ft. 2 ins. This has been done by eliminating the charging hopper and emptying direct from skip into mixer.

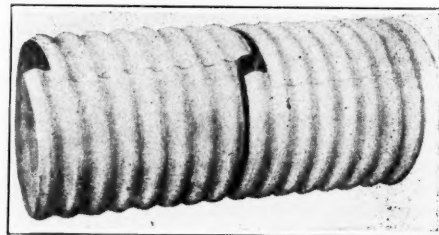
The driving wheels are 44-ins. in diameter and the front wheels 40-ins., the tires being 10-ins. and 8-ins., respectively. By using these large wheels an 18-inch clearance above the ground has been made possible, thus avoiding any jacking up of the machine to clear manholes which are liable to project 12-ins. or more above the sub-grade of an unfinished street. When desired, flanges may be bolted to the tires, thus making the outfit suitable for operation under the machine's own power on

trolley tracks, etc. If the outfit is to be drawn behind a trolley car at high speed, standard flanged wheels may be readily substituted for the ones regularly furnished, as the wheels are easily taken off inasmuch as the driving axle is mounted in split boxes and the front axle can be swung around and the wheels slipped off.

All of the operating levers have been brought adjacent to the operating platform at one side of the machine. The steering wheel is in front. The line shaft is driven by chain and the power is transmitted through clutches to the windlass for operating the hoist, the drum and the traction wheels. Of course, when desired an electric motor can be substituted for the gasoline engine, and when operated in railway service the motor could be run from overhead trolley wire.

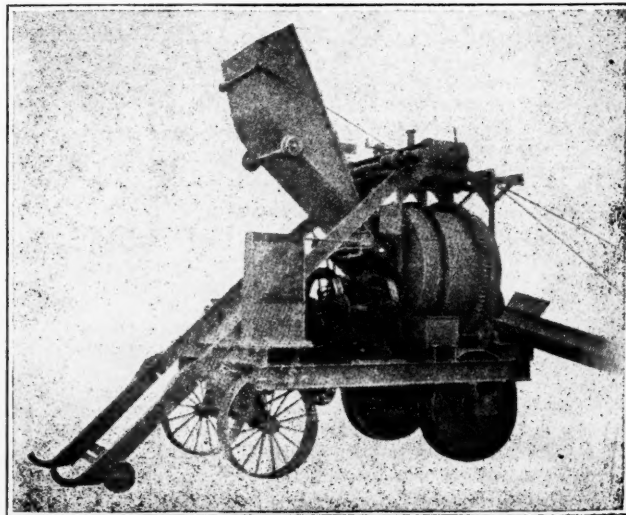
Spiral Lock-Joint Corrugated Metal Culvert

The Birmingham Metal Products Co., Birmingham, Ala., have placed on the market a metal culvert in which the corrugations are made spirally so that one section locks into the adjoining one.



NEW CORRUGATED METAL CULVERT.

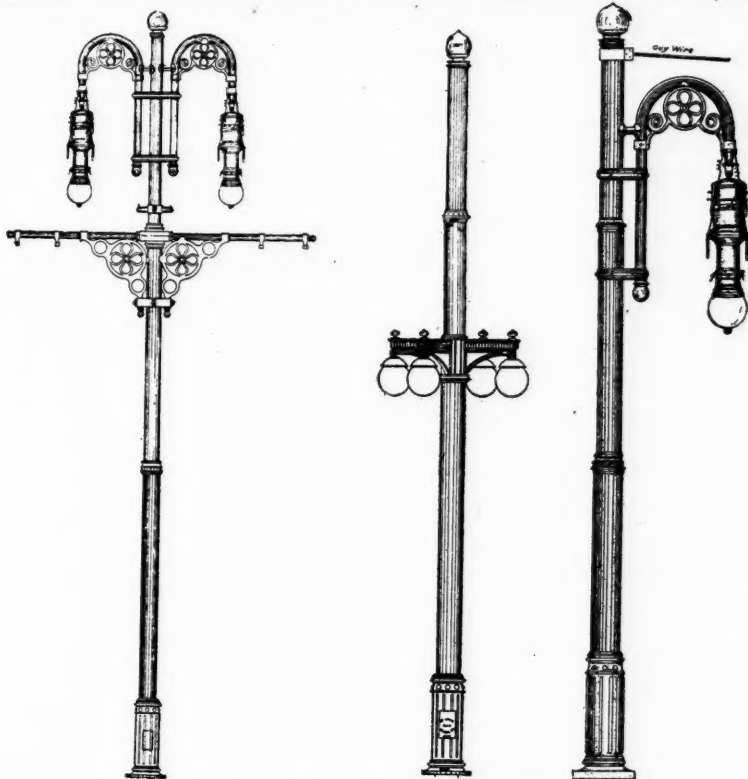
As compared with the older style of corrugated culvert, simplicity of construction, increased strength, greater durability and higher efficiency are claimed. The fact that the corrugations run in a spiral manner entirely around the culvert, there being no break in the continuity of the corrugations, and the absence of bolts and rivets are claimed to give greater durability. There is but one lap to each section of the spiral culvert, and this lap is electrically welded. The metal of which the culvert is made is said to be non-corrosive. It is also claimed that the corrugations tend to distribute the wear in a more uniform manner. The spiral grooves also tend to keep the culvert clean. On account of the



RANSOME STREET CONCRETE MIXER.

spirals the water is not retarded as much as by circular corrugations, and the capacity is claimed to be increased

use where two car tracks run in a parallel space in the center of the street is particularly attractive.



COMBINED LIGHTING AND TROLLEY POLES.

25 per cent. The sections are 26 inches long, made of the heaviest metal that can be successfully rolled. The culvert is made in sizes from 8 to 72 inches. The address of the Birmingham Metal Products Company is 601 Woodward Building, Birmingham, Ala.

Lighting Standards

The St. Louis Car Wheel Company, Bank of Commerce building, St. Louis, Mo., make street lighting standards for boulevard lighting of original design, but following in general the usual outlines of such standards. These include four and five light standards with either erect or inverted lights. The company also makes arc light poles of the shepherd's crook or cross-arm design with one or more lights.

The illustration shows three designs of trolley and lighting standards combined. The advantage of these is that their use decreases the number of poles on a street, giving it a much handsomer appearance. The "special street railway combination pole" suitable for

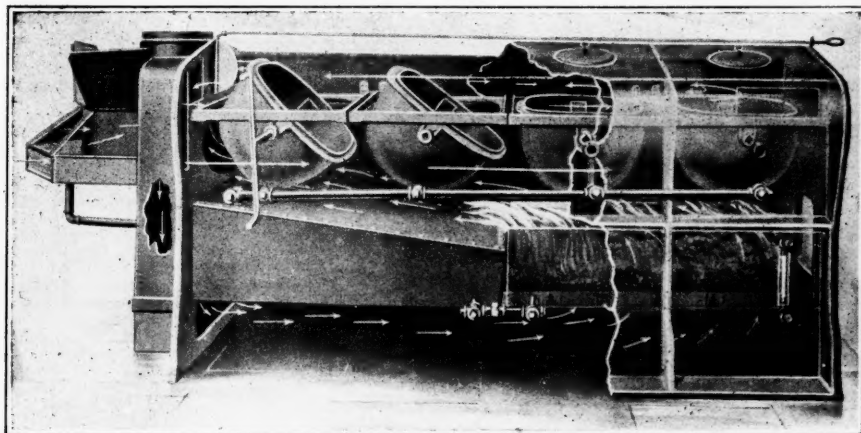
Refuse Destructors of Moderate Capacity

The United States Incinerator Co., Buffalo, N. Y., manufacture sanitary toilets and refuse destructors which are much used in the camps of the United States Army and are suitable for municipal purposes. For contractors' camps located in water sheds used as sources of municipal water supplies no device could be more sanitary. The toilet incinerator and the garbage incinerator are similarly constructed, except in the latter seats and receivers are omitted. The illustration shows the drafts and arrangements for combustion, as well as the general construction. The garbage incinerator fills a long felt want in hospitals, sanitariums and kindred institutions, particularly those treating tuberculosis and other contagious and infectious diseases; for, unlike any other incinerator or garbage destroyer, the fire does not come in direct contact with the refuse, it being entirely reduced to a fine innocuous ash while

within the container. It is therefore impossible for charred particles of germ laden refuse to be transmitted into the atmosphere through the chimney by draft action, for before even the draft can reach the chimney outlet, it must first pass through the fire. In making its circuit of the incinerator, the draft assumes five distinct travels prior to its passage into the flue. Even the ashes from incinerated refuse are dumped on the fire after incineration is completed, serving as a double preventive against the escape of an atom of refuse from cremation, once deposited in the incinerator. Wet refuse and slops are as readily and economically disposed of as dry refuse, in an absolutely sanitary manner, and without requiring any additional attention. The installation is a very simple matter, and it is usually made where the incinerator will be most accessible and convenient to originating source of waste, to eliminate handling as far as possible. Operating is easily and economically performed, there being no parts to claim any special attention. Its construction is cast iron, being lined throughout with fire brick and asbestos board. Heat radiation is reduced to a minimum, and maximum results are obtained from confinement of the heat. Wood, soft coal or coke is used for fuel.

Tyer for Reinforcing Rods

Clifford L. Miller & Co., 110 East 23d street, New York City, manufactures a simple and effective tool and special wire for binding reinforcing rods and mesh in concrete construction. The device has been used for some time as a means of tying bags of cement or other similar material. The advantages of the Curry tyer for reinforcement are that full speed of work can be maintained in cold or extreme weather conditions. The tying is uniform at all joints and the rods cannot slip. No time or wire is lost in cutting coils. As the tying tool is of no use for other purposes it is not apt to be stolen or lost. The tyer consists of a wire of suitable diameter and length, with a small loop on each end. The wire is passed under the reinforcing rods and each loop is slipped over a corresponding hook on the tying tool. The handle is pulled back, causing the spindle carrying the hooks to revolve, completing the tie.



INCINERATOR FOR REFUSE CONTAINING LARGE PERCENTAGE OF WATER.



BINDING REINFORCING RODS.

INDUSTRIAL NEWS

Cast Iron Pipe.—Chicago—Several large municipal contracts have been awarded and several are pending. Quotations: 4-inch, \$27; 6 to 12-inch, \$25; 16-inch and up, \$24.50. Birmingham.—The general disposition of the pipe market is toward strength in response to that of the iron market, but makers have not as yet decided on any advance and none of a definite nature is under consideration. All the Birmingham district plants are reported operating on full time. Shipments have been somewhat hampered by the rainy weather, especially those destined for the West and Southwest. The outlook is considered good even by the most conservative. Quotations: 4 to 6-inch, \$23; 8 to 12-inch, \$22; over 12-inch, average, \$21.50. San Francisco.—Small orders are coming out more freely, and some important inquiries are taking definite shape. New York.—The trade is expecting early announcement of contracts to be placed by the city of New York, involving heavy quantities of pipe. It is believed that lettings may be announced in June. Meanwhile pipe buying is quiet, no lettings of importance being before the trade in this section of the country. Private business is fair. Quotations: 6-inch, carloads, \$21 to \$23.

Lead.—Market is quiet but firmer. Quotations: New York 4.20c.; St. Louis, 4.07c.

New Gate Valve.—The Giant Valve & Manufacturing Co., Oakland, Cal., is preparing to market a high-pressure gate valve which embodies several entirely new principles and is claimed to have many points of superiority over the present standard types. A site has been secured adjoining the C. L. Best Manufacturing Co., San Leandro, Cal., and it is proposed to install a small machine shop very shortly, with a foundry later. T. M. Edmonds, assistant secretary of the Spring Valley Water Co., is president, and Dave Hirstel vice-president and manager.

Standard Flanges.—A circular regarding standardized flanges for valves and fittings is being distributed generally to users of valves and fittings by the Committee of Manufacturers on Standardization of Fittings and Valves, W. H. Douglas, secretary, 30 Church street, New York City, asking the recipient not to order flanged fittings under the 1912 U. S. standard. This is a standard recently promulgated under the joint recommendation of the American Society of Mechanical Engineers, the National Association of Master Steam and Hot Water Fitters and the American Society of Heating and Ventilating Engineers. A list of 48 companies, members of the Manufacturers' Standardization Committee, is appended to the notice, which states that the 1912 standard does not compare with the one in general use by the manufacturers, and that, on the other hand, the manufacturers' standard compares favorably with the table of dimensions of the standards for high pressure lines issued by the Society of German Engineers in 1900, and with the report issued by the Engineering Standards Committee on British standard tables of pipe flanges. It is stated also that the committee has presented a proposed standard to the committees of the American Society of Mechanical Engineers and the National Association of Master Steam and Hot Water Fitters.

H. G. Scott, superintendent of motive power, Interborough Rapid Transit Co., New York City, who was also chairman of the committee of the American Society of Mechanical Engineers having this work in charge, and Calvin W. Rice, secretary of the society, both state that there is no intention on the part of that society's committee to reconsider the flange standards for valves and fittings. In the year and a half in which the question was considered all interested, it is explained, were invited to participate, and a number of manufacturers have, indeed, offered to supply valves and fittings to the 1912 standard. Among others, different departments of the United States Government have adopted the standard.

General Electric Bulletins.—The General Electric Company, Schenectady, N. Y., has recently issued the following bulletins: No. 4,933, small polyphase motors; No. 4,934, battery charging rheostats; No. 4,942, direct current test meter; No. 4,943, direct current motor starting panels for heavy service; No. 4,941, G. E. water flow meters; No. 4,923, modern electrical equipment for economical production of iron and steel; No. 4,922, electricity in metal mines; No. 4,935, G. E. railway motors; No. 4,915, direct current motors; No. 4,944, isolated and small plant alternating current switchboard panels; No. 4,947, Edison Mazda and Gem lamps for standard electric railway service; No. 4,943, electric hoists. The advantages claimed for electric operation of hoists for construction work are: 1. Saving in power consumption. 2. Superior speed control. 3. Simpler operation. 4. Greater flexibility. 5. Lighter weight. 6. More compact. 7. Self-contained. 8. Smaller number of parts to get out of order. 9. No reciprocating parts. 10. No smoke or exhaust steam nuisance. 11. No cylinders to freeze. 12. Better adapted for underground operation. 13. Does not require skilled engineer to operate.

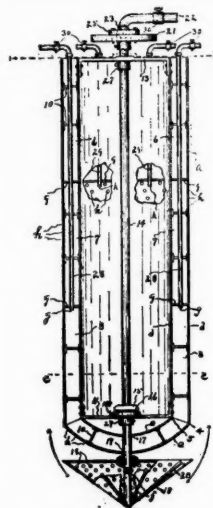
Nursery for Small Industries.—The Hydraulic Power Co., Niagara Falls, N. Y., intends soon to break ground for an immense factory building, in the lower milling district, to be used as a nursery plant, a place where small manufacturers desirous of establishing themselves in Niagara Falls can get floor space while they are building up their business to proportions that may require an independent plant, or where inventors may develop commercial processes. The principal industrial drawback to the city has been that there was no place for the small manufacturer. The power companies have sold their current in large blocks and have not encouraged the manufacturer requiring a small amount of power to locate there. Plans for the building are being made by J. Rattray, Gluck building, Niagara Falls, and construction will start within a month.

Pedestal Concrete Piles.—The MacArthur Concrete Pile & Foundation Co., 11 Pine street, New York City, announce that they have been awarded a contract for more than 2,700 Pedestal concrete piles, together with a large amount of concrete capping and similar work for the new shops of the Boston & Maine Railroad at North Billerica, Mass. It is the largest concrete piling contract that has been awarded in the East for a number of years. A. B. Corthell is the chief engineer, F. W. Irwin, special engineer, and S. P. Coffin, assistant engineer in charge of the work in the field.

PATENT CLAIMS

1,024,821. CAISSON CONSTRUCTION. Edward Bignell, Lincoln, Nebr. Serial No. 641,609.

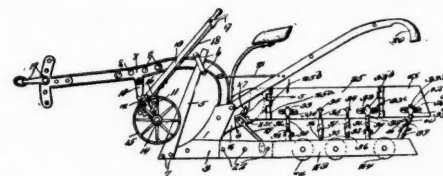
A caisson comprising an upright, elongated receptacle; a rotatable, tubular shaft longitudinally traversing the receptacle; a hollow drill-head having a



perforated wall disposed below the receptacle and mounted upon the shaft; said tubular shaft and drill-head forming a conduit for the passage therethrough of a liquid element.

1,026,018. GRADING-MACHINE. Bolah Alpherd Baker, Rice, La. Serial No. 656,122.

In combination with a plow, a grading wing adjustably connected to the mold-board of the plow, an extension connected to the land side of the plow, telescopic rod connections between the extension and the grading wing, rods having turnbuckle connections between the wing and the extension whereby the wing may be brought toward or from the extension, means carried by the telescop-



ing rod for holding the wing when adjusted, an extension wing hinged to the grading wing, means for holding the extension wing adjusted at various angles relative to the grading wing, the telescoping rods having universal connections with the grading wing and the first extension, means for holding the grading wing in adjusted position vertically, and an adjustable gage wheel and cutter for the plow.

1,026,639. METHOD OF OPERATING INTERNAL-COMBUSTION PUMPS. Henry M. Chance and Thomas M. Chance, Philadelphia, Pa. Serial No. 627,563.

The hereinbefore described method of operating internal combustion pumps in which a moving body of liquid acts upon an actuator to effect compression of the combustible mixture prior to the ignition thereof, which consists in transmitting energy to said body of liquid to effect the return-stroke of said body of liquid; in causing said body of liquid to attain relatively high velocity; in so proportioning the dimensions and velocity of said body of liquid that the energy represented by the momentum of said body of liquid and the energy directly transmitted by said body of liquid will be sufficient to compress said combustible mixture to a pressure such that the rise in temperature produced by said compression will be sufficient to cause said combustible mixture to ignite; in so compressing said combustible mixture and in causing the ignition of said combustible mixture by the rise in temperature produced by the compression thereof.

THE WEEK'S CONTRACT NEWS

Relating to Municipal and Public Work—Street Improvements—Paving, Road Making, Cleaning and Sprinkling—Sewerage, Water Supply and Public Lighting—Fire Equipment and Supplies—Bridges and Concrete Work—Sanitation Garbage and Waste Disposal—Police, Parks and Miscellaneous—Proposals and Awards.

To be of value this matter must be printed in the number immediately following its receipt, which makes it impossible for us to verify it all. Our sources of information are believed to be reliable, but we cannot guarantee the correctness of all items. Parties in charge of proposed work are requested to send us information concerning it as early as possible; also corrections of any errors discovered.

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK.	ADDRESS INQUIRIES TO
STREET IMPROVEMENTS				
Kansas.....	Winchester.....	June 3, noon.....	Constrn. sidewalks.....	J. B. Armstead, Mayor.
Indiana.....	Huntington.....	June 3, 10 a.m.....	Constrn. gravel road.....	H. Guthrie, County Aud.
Indiana.....	Jasper.....	June 3, 1 p.m.....	Constrn. gravel road.....	J. H. Seng, County Aud.
New Jersey.....	Elizabeth.....	June 3, 8.30 p.m.....	Constrn. 6,000 yds. brick pav't and resetting 15,000 ft. curb	W. P. Neafsey, Comm.
Indiana.....	Fort Wayne.....	June 3, 3 p.m.....	Constrn. 4 sidewalk improvements.....	F. T. Benoy, Chm. Bd. Pub. Wks.
Ohio.....	Youngstown.....	June 3, noon.....	Pavg. 5 streets.....	W. H. McMillin, Clk. Dir. Pb. Serv.
New York.....	Albany.....	June 3, 1 p.m.....	Constrn. State roads.....	State Highway Comm.
Indiana.....	English.....	June 3, 2 p.m.....	Constrn. stone roads.....	J. E. Jones, Aud.
Indiana.....	Kentland.....	June 3, 2 p.m.....	Constrn. macadam.....	E. R. Brigham, Aud.
Indiana.....	Newport.....	June 3, 10 a.m.....	Constrn. gravel roads.....	H. T. Payne, Aud.
Indiana.....	Portland.....	June 3, 10 a.m.....	Constrn. roads.....	John Bonifas, Aud.
Indiana.....	Salem.....	June 3.....	Constrn. roads.....	F. S. Murkelt, Aud.
Indiana.....	Vernon.....	June 3, 11 a.m.....	Constrn. roads.....	M. W. Brogan, County Aud.
Indiana.....	Versailles.....	June 3, 1 p.m.....	Constrn. macadamized road.....	J. F. Lockard, Aud.
Georgia.....	Gainesville.....	June 3, 2 p.m.....	Constrn. 18,000 yds. street pav't.....	J. H. White, Clk.
Indiana.....	Shoals.....	June 3.....	Constrn. stone roads.....	J. T. Morris, County Aud.
Indiana.....	Scottsburg.....	June 3.....	Constrn. gravel road.....	Robert Blunt, County Aud.
New Jersey.....	Newark.....	June 3, 3 p.m.....	Furn. & sprinkling 75 miles with road oil.....	Bd. of Freeholders.
New York.....	Saratoga Springs.....	June 3, 7.30 p.m.....	Sprinkling sts. with water and oil.....	Clarence Bird, Clk.
Ohio.....	Cleveland.....	June 3, noon.....	Constrn. pav't.....	W. J. Springborn, Dir. Pub. Serv.
North Dakota.....	Dickinson.....	June 3, 8 a.m.....	Constrn. cement sidewalks and crossings.....	R. C. Hill, Register.
Pennsylvania.....	Smithton.....	June 3, 6 p.m.....	Pavg. First street.....	W. R. Baird, Vil. Pres.
Iowa.....	Clinton.....	June 4.....	Constrn. 13,000 yds. wood, brick or asph. or concrete pav'ts	J. G. Thorne, City Engr.
New York.....	Niagara Falls.....	June 4, 7.30 p.m.....	Constrn. pav'ts on 6 streets.....	F. S. Parkhurst, Jr., City Engr.
Mississippi.....	Kosciusko.....	June 4, 8 p.m.....	Constrn. concrete sidewalks.....	Mayor.
Pennsylvania.....	McKeesport.....	June 4, 8 p.m.....	Furn. 2 cars paving brick.....	C. E. Soles, Compt.
New York.....	New York.....	June 4, 10.30 a.m.....	Pavg. with sheet asph. bit. pav't, asph. block, granite, etc.....	C. C. Miller, Boro. Pres.
Utah.....	Ogden.....	June 4.....	Constrn. asphalt pav't.....	H. J. Craven, City Engr.
Indiana.....	Winnemac.....	June 4.....	Constrn. 2 roads.....	W. E. Munchenburg, County Aud.
Louisiana.....	New Orleans.....	June 4, noon.....	Constrn. 33 miles highway.....	Gervais Lombard, State Engr.
Indiana.....	Lawrenceburg.....	June 4.....	Constrn. roads.....	W. S. Fagaly, County Aud.
Indiana.....	Valparaiso.....	June 4.....	Constrn. gravel roads.....	C. A. Blachly, County Aud.
Indiana.....	Delphi.....	June 4.....	Constrn. gravel roads.....	M. G. Haun, County Aud.
Indiana.....	Bedford.....	June 4, 1 p.m.....	Constrn. 6 gravel and macadam roads.....	E. W. Edwards, Aud.
Indiana.....	Rushville.....	June 4, 2 p.m.....	Constrn. gravel roads.....	J. M. Stone, Aud.
Indiana.....	Sullivan.....	June 4, noon.....	Constrn. roads.....	W. F. Bicknell, Aud.
Indiana.....	Covington.....	June 4, 1.30 p.m.....	Imp. 4 highways.....	W. B. Gray, County Aud.
Pennsylvania.....	Sharon.....	June 4, noon.....	Pavg. Boyce street.....	O. J. Denny, Sec'y Council.
Iowa.....	Waverly.....	June 4.....	Constrn. 34,000 ft. pav't.....	F. A. Lee, City Clk.
Iowa.....	Fort Dodge.....	June 4.....	Constrn. 63,000 ft. cement sidewalks.....	C. H. Reynolds, City Engr.
Alabama.....	Wetumpka.....	June 4, noon.....	Constrn. gravel roads; cost, \$8,000.....	W. S. Keller, State Highway Engr.
No. Carolina.....	Henderson.....	June 4, 3 p.m.....	Constrn. 20,000 yds. bituminous macadam.....	W. A. Hunt, Chm. Comm.
Indiana.....	Marion.....	June 4, 2 p.m.....	Constrn. several highways.....	E. H. Kimball, County Aud.
Indiana.....	Vincennes.....	June 4, 2 p.m.....	Constrn. 2 miles gravel roads.....	J. T. Scott, County Aud.
Indiana.....	Crawfordsville.....	June 4, 10 a.m.....	Pavg. several roads.....	B. B. Engle, County Aud.
Ohio.....	Columbus.....	June 4.....	Macad. 1 road, imp. 2.....	County Commissioners.
Louisiana.....	Lake Charles.....	June 4, 8 p.m.....	Constrn. 5 miles of pav't.....	C. B. Richard, Mayor.
Illinois.....	Ashton.....	June 4, 1 p.m.....	Macadam, 6 miles of road and redressing 5½ miles of road.....	Geo. B. Stephan, Town Clk.
New York.....	Cohoes.....	June 4.....	Pavg. alley with granite.....	S. R. Tighe, City Engr.
Ohio.....	Steinersville.....	June 4.....	Macad. 2.4 miles road.....	G. L. Bonar, Clk.
New York.....	Albany.....	June 4, 1 p.m.....	Constrn. State roads.....	State Highway Comm.
Ohio.....	Norwalk.....	June 5, 1 p.m.....	Constrn. 1 mile concrete roadway and 1¼ macad. road.....	A. E. Ward, Clk.
New York.....	Albany.....	June 5, 1 p.m.....	Constrn. State roads.....	State Highway Comm.
Indiana.....	Bloomington.....	June 5, 2 p.m.....	Constrn. stone roads.....	Horace Blakely, Aud.
Indiana.....	Richmond.....	June 5, 11 a.m.....	Imp. highways.....	L. F. Bowman, Aud.
Ohio.....	Norwalk.....	June 5, 1.30 p.m.....	Constrn. concrete pav't.....	J. M. Reichtol, Township Clk.
New York.....	Buffalo.....	June 5, 11 a.m.....	Grad. several streets.....	F. G. Ward, Comm.
New York.....	Brooklyn.....	June 5, 11 a.m.....	Laying sidewalks, constrn. granite and asphalt pav'ts.....	A. E. Steers, Boro. Pres.
Ohio.....	Niles.....	June 5, 2 p.m.....	Constrn. stone & concrete sidewalks.....	Dir. Pub. Serv.
Maine.....	Augusta.....	June 6, noon.....	Constrn. road in Kennebunkport.....	P. L. Hardison, Comm.
Washington.....	Wenatchee.....	June 6.....	Constrn. highways.....	Co. Comm.
Florida.....	Miami.....	June 6.....	Constrn. pav't.....	W. P. Moore, City Clk.
New Jersey.....	Newark.....	June 6, 3.15 p.m.....	Grad. and paving a number of streets.....	Morris Sherrard, Chief Engr.
Indiana.....	Bluffton.....	June 6, 10 a.m.....	Constrn. gravel roads.....	L. A. Williamson, Aud.
New York.....	Albany.....	June 6, 1 p.m.....	Constrn. State roads.....	State Highway Comm.
Indiana.....	Brazil.....	June 7, 11.30 a.m.....	Constrn. limestone road.....	E. A. Staggs, County Aud.
Alabama.....	Athens.....	June 7, 8 p.m.....	Constrn. 5,000 yds. cement sidewalks.....	A. P. Henderson, City Engr.
Ohio.....	Toledo.....	June 7, 10 a.m.....	Furn. macadam for road imp.....	C. J. Sanzenbacher, County Aud.
New York.....	Albany.....	June 7, 1 p.m.....	Constrn. State roads.....	State Highway Comm.
Indiana.....	Osgood.....	June 7.....	Imp. street and constrn. sidewalk.....	M. F. Hollman, Vil. Pres.
Washington.....	Davenport.....	June 7.....	Constrn. highway.....	J. W. Brislawn, Clk. Co. Comm.
Arkansas.....	Little Rock.....	June 8.....	Constrn. 45,000 yds. brick pav't.....	City Clerk.
Tennessee.....	Benton.....	June 8.....	Constrn. road.....	J. H. Williamson, Chm. Comm.
Massachusetts.....	Roston.....	June 10, 1 p.m.....	Constrn. roads, walks, etc., at Fort Andrews.....	Capt. R. H. C. Kelton, C. Q. M.
North Dakota.....	Rowdon.....	June 10, 2 p.m.....	Gradg. approaches to bridge.....	O. H. Gramppmann, Chm.
West Virginia.....	Wheeling.....	June 10.....	Constrn. pav't.....	Commissioners.
Florida.....	Tallahassee.....	June 10.....	Constrn. 22,000 yds. brick paving.....	J. E. Craig, City Engr.
Kansas.....	Hutchinson.....	June 10.....	Macadam road.....	F. M. Holcomb, Clk. Co. Comm.
Michigan.....	Monroe.....	June 10.....	Constrn. concrete pav't.....	City Clk.
New Jersey.....	Camden.....	June 10, 11 a.m.....	Constrn. asphalt pav't.....	Court House Committee.
Nebraska.....	Kearney.....	June 10, noon.....	Constrn. roadway approach to bridge.....	J. H. Dean, Co. Clk.
Missouri.....	St. Louis.....	June 11.....	Paving alleys; cost, \$70,000.....	Bd. Pub. Imp.
Ohio.....	Akron.....	June 11, 11 a.m.....	Imp. road.....	C. L. Bowers, Clk. County Comrs.
Kansas.....	Leavenworth.....	June 12, 11 a.m.....	Constrn. sidewalks, curbs, gutters, etc.....	Major G. G. Bailey, C. Q. M.
Ohio.....	Ironton.....	June 12, noon.....	Constrn. sidewalks.....	F. A. Ross, City Clk.
Pennsylvania.....	Pittsburgh.....	June 13, 10 a.m.....	Imp. half mile highways.....	R. J. Cunningham, County Compt.
Indiana.....	Marion.....	June 13, 2 p.m.....	Constrn. gravel roads.....	E. H. Kimball, Aud.
Indiana.....	Fort Wayne.....	June 13.....	Constrn. 50,000 yds. brick and asphalt pav't.....	W. H. Becker, Sec. Bd. Pub. Wks.
Ohio.....	Subansville.....	June 14, noon.....	Constrn. turnpike in Cross Creek township.....	J. M. Thompson, Comm.
Washington.....	Pacemerton.....	June 15, 11 a.m.....	Constrn. concrete sidewalks.....	Navy Department.
Ohio.....	Cleveland Hgts.....	June 18, noon.....	Treating roads with oil.....	H. H. Canfield, Vil. Clk.
Ohio.....	Newark.....	June 20 (about).....	Constrn. 8,590 sq. yds. pav't and 4,810 lin. ft. curbing.....	C. H. Wells, City Engr.
Oregon.....	Fossil.....	July 3, 1 p.m.....	Constrn. roads and bridges.....	H. F. C. Heidtmann, County Surv.

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
SEWERAGE				
South Dakota	Pierre	June 3	Constrn. 5 miles clay pipe sewer	J. A. Rose, City Aud.
Nebraska	Falls City	June 3, 5.30 p.m.	Constrn. sewers, district No. 2	W. Wiltse, City Clk.
Iowa	Reinbeck	June 4	Constrn. sewer system and water works	R. D. Ferguson, Town Clk.
Canada	Toronto, Ont.	June 4	Constrn. storm overflow sewer	G. R. Geary, Mayor.
Ohio	Toledo	June 5, noon	Constrn. several local sewers	Dir. Public Service.
Pennsylvania	McKeesport	June 6, 8 p.m.	Constrn. brick and concrete sewers	C. E. Soles, Compt.
Ohio	Wauseon	June 10, 7.30 p.m.	Constrn. sewerage system	L. H. Deys, Vil. Clk.
New Jersey	South Amboy	June 11	Constrn. sewer system	R. M. Mack, City Clk.
Minnesota	Morris	June 11, 8 p.m.	Constrn. about 3,000 ft. 8-in. sewer pipe, etc.	C. B. Burpee, City Clk.
Ohio	Canton	June 15	Extend. storm sewer, Liberty street	P. H. Weber, City Engr.
Louisiana	Opelousas	June 15 (about)	Constrn. sewer system	W. D. Kirkpatrick, Engr., Birming'm.
Ohio	Newburg	June 15	Constrn. sewers	J. Shimek, Clk.
Idaho	Sand Point	June 15	Constrn. 23,000 ft. sewers	W. J. Costello, Clk.
North Carolina	Wilmington	June 18	Constrn. sewer system	F. F. Pillet, City Engr.
Iowa	Burlington	June 20	Constrn. concrete arch sewer	H. B. Volmer, City Engr.
Louisiana	New Orleans	June 20, noon	Constrn. power house and canals	F. S. Shields, Sec'y Water Bd.
Ohio	Cambridge	July 6	Constrn. 3,700 ft. clay pipe and 600 ft. c. i. pipe sewer; also ejector	K. M. Cosgrove, City Engr.
Iowa	Burlington	July 20	Constrn. concrete arch sewer; cost, \$50,000	H. G. Vollmer, City Engr.
WATER SUPPLY				
Nebraska	Louisville	June 3	Constrn. water works; cost, \$16,000	C. A. Richey, Chm. Village Bd.
Canada	Hamilton, Ont.	June 3, 5 p.m.	Furn. turbine pumps	S. H. Kent, City Clk.
Colorado	Salida	June 3	Constrn. 7,000 ft. 16-in. wood pipe & 6,600 ft. 12-in. c. i. pipe	H. H. Parker, City Clk.
California	Orange	June 3	Constrn. concrete pumping plant & laying 5,400 ft. pipe	City Trustees, Mayberry & Parker, Engrs., Los Angeles.
Illinois	Delavan	June 4, 8.30 p.m.	Constrn. water mains	J. P. Roberts, City Engr.
Pennsylvania	Tarentum	June 7	Constrn. water works; cost, \$100,000	Council.
Canada	Vernon, B. C.	June 10, 5 p.m.	Furn. 27,000 ft. 4 and 6-in. c. i. pipe	D. G. Tate, City Clk.
Montana	Shelby	June 10	Constrn. of water works, cost \$20,000	J. E. Nolan, City Engineer.
Oklahoma	Fort Sill	June 10, 10 a.m.	Constrn. 10-in. main, elec. motor, pump & water purify. appa.	G. M. Cralle, Constrn. Q. M.
Ohio	Newburg	June 15	Constrn. water mains	J. Shimek, Clk.
West Virginia	Elkins	June 15, 4 p.m.	Repair. reservoir	George Henry, City Clk.
North Dakota	Beach	June 15	Constrn. water works; cost, \$25,000	M. A. Egan, City Aud.
Ohio	Grand View Hts.	June 17	Constrn. water and sewer pipe	J. Hinterschied, Vil. Clk.
Rhode Island	Newport	June 22, 11 a.m.	Constrn. fresh water supply pipe under water	H. R. Stanford, Chief of Bureau.
Spain	Madrid	July 31	Constrn. filtration and purification plant	Canal Commission.
Ohio	Bexley	July 1 (about)	Constrn. water and sewer system	F. D. Chamberlin, Mayor.
Louisiana	New Orleans	July 8, 3 p.m.	Furn. sluice gates	F. S. Shields, Sec. Sew. & Wat. Bd.
LIGHTING AND POWER				
Pennsylvania	Ephrata	June 3	Furn. one 375 KVA steam turbine unit	T. C. Reddig, Boro. Sec'y.
Canada	Hamilton, Ont.	June 3	Furn. 2 turbine pumps, 6,500,000 gal. capacity each	S. H. Kent, City Clk.
Mississippi	Yazoo	June 8	Furn. generators, etc.	Public Service Comm.
Canada	Vernon, B. C.	June 10	Furn. one 125-KW. generator switchboard, etc.	D. G. Tate, City Clk.
Minnesota	Olivia	June 10	Furn. one 75-HP. oil engine	J. Flaschenreim, Vil. Recorder.
Canada	Moose Jaw, Sask.	June 14, noon	Furn. 50 ornamental light standards	City Comm.
Minnesota	Coleraine	June 15	Constrn. lighting system	W. W. Hunter, City Clk.
Georgia	Fort Oglethorpe	June 15, 11 a.m.	Constrn. electric lighting system	Capt. Guy Cushman, C. Q. M.
Louisiana	New Orleans	June 20, noon	Constrn. power house	F. S. Shields, Sec'y.
FIRE EQUIPMENT				
Kansas	Wichita	June 8	Constrn. fire and police telegraph system	Wm. Sence, City Clk.
Ohio	Cleveland	June 8, noon	Furn. auto comb. pump. eng. & hose wagon; also police patrol	C. W. Stage, Dir. Pub. Safety.
Pennsylvania	Scranton	June 5, 11 a.m.	Furn. 3 comb. chemical and hose motor wagons	W. G. O'Malley, Dir.
Ohio	Cleveland	June 7, noon	Furn. pumps for fire service pumping station	W. J. Springborn, Dir. Public Serv.
Ohio	Ottawa	June 8, noon	Furn. comb. chemical and hose auto	H. C. Gerding, Vil. Clk.
BRIDGES				
Pennsylvania	Bedford	June 3, noon	Constrn. concrete substructure and steel bridge	G. R. Shuck, Clk.
Oregon	Medford	June 4, 10.30 a.m.	Constrn. reinforced concrete bridge	J. R. Neil, County Judge.
Indiana	Indianapolis	June 5, 10 a.m.	Constrn. culvert and bridge	W. T. Patten, County Aud.
Indiana	Richmond	June 5, 11 a.m.	Constrn. several concrete bridges	L. S. Bowman, County Aud.
Canada	Tara, Ont.	June 6	Constrn. two steel bridges with concrete floors & abutments	Joseph Grant, Reeve.
Pennsylvania	Lewistown	June 10, 7.30 p.m.	Constrn. 2 reinforced concrete bridges	J. H. Saxton, Boro. Sec'y.
Tennessee	Hill City	June 11, 10 a.m.	Constrn. concrete bridge	W. L. Dodds, County Engr.
Ohio	Cleveland	June 19	Constrn. bridgework	J. F. Goldenbogen, Co. Clk.
Ohio	Cleveland	June 26, 11 a.m.	Constrn. bridges and culverts	J. F. Goldenbogen, County Clk.
MISCELLANEOUS				
North Carolina	Morgantown	June 3, noon	Bldg. jail	County Commissioners.
New Jersey	Jersey City	June 3, 10.30 a.m.	Remov. old pier and building new	D. T. Hart, Sec'y Harbor Comm.
New York	New York	June 4, 11 a.m.	Furn. & directing 150 miles wire fence with concrete posts	Chas. Strauss, Pres. Bd. Water Sup.
Indiana	Brazil	June 4	Constrn. court house, including heating plant	E. A. Staggs, County Aud.
New Jersey	Elizabeth	June 4, 4.30 p.m.	Furn. 300 bbls. fuel oil	Union County Mosquito Comm.
Florida	Titusville	June 4	Constrn. court house; cost, \$30,000	A. A. Stewart, Co. Clk.
New York	New York	June 5, 11 a.m.	Furn. automobile touring car	A. E. Steers, Boro. Pres.
Pennsylvania	McKeesport	June 5	Constrn. iron steps	C. E. Soles, Compt.
Indiana	Marion	June 11	Bldg. market house & civic hall	F. R. Heck, City Clk.
Canada	Saskatoon, Sask.	June 25	Furn. 70-ton incinerator	City Commissioners.
Texas	Dallas	July 15, 2 p.m.	Constrn. city hall; cost, \$400,000	City Commissioners.

STREET IMPROVEMENTS

Gadsden, Ala.—City Council has adopted resolution granting petition of property holders to treat Walnut st. with oil. City Attorney has been instructed to draw up necessary ordinance and call for bids for oil will be made within next few weeks.

Los Angeles, Cal.—Widening of Broadway, Spring and Main sts., from curbs to building walls, and arcading of first floors to width of 12 ft., in order to accommodate increasing traffic on Los Angeles streets are contemplated.

Los Angeles, Cal.—Many street and other improvements have been ordered or approved by City Council.

Marysville, Cal.—Plans and specifications have been adopted for paving of many blocks of streets, and work will be undertaken in few days.

Riverside, Cal.—Board of Supervisors has appropriated \$2,000 to be used in improvement of three miles of road in Santa Ana canyon. Entire work will cost more than \$5,000.

San Rafael, Cal.—Petition requesting State Highway Commission to survey proposed State highway, from route of which Marin County has been left out, through various town of county from Sausalito to San Rafael and so on to Petaluma, is being prepared by Marin Promotion League.

Santa Ana, Cal.—Board of Supervisors has passed resolution to effect that it stands ready to further building of coast road from Bay City to Laguna Beach.

Waterbury, Conn.—Oiling of Baldwin st. is being considered.

Atlanta, Ga.—Newman ave., one of old county roads, which is the principal thoroughfare of Colonial Hills subdivision, near East Point, will be paved during present year by County Commissioners.

Augusta, Ga.—Ordinance has been passed for construction and laying of curbing on both sides of Central ave., from Monte Sano ave. to Baker ave.

Rome, Ga.—City Engineer has been instructed to advertise for bids for con-

struction of cement sidewalk in South Rome and in other parts of city.

Rome, Ga.—Mayor and superintendent have been authorized to purchase one or more street sprinklers. They may decide to purchase automobile sprinkler, which will cost about \$1,500. A one-horse sprinkler will cost \$218 and each horse or mule from \$175 to \$300, making total in the neighborhood of \$500.

Coeur D'Alene, Idaho—People will shortly vote on amount of \$27,000 to pay for constructing sidewalks at corner intersections.

Taylorville, Ill.—J. S. Michels, C. E., is making surveys and preparing plans for about 2 miles of street paving, principally brick on concrete base, with asphalt filler, which will probably be constructed this summer.

Evansville, Ind.—Viewers on proposed new St. Joseph rd. have reported favorably on improvement of road with rock for distance of 2½ miles. Estimated cost of \$9,500 will be divided between Ger-

man and Center Townships as road runs along township line.

Indianapolis, Ind.—Resolution for paving Dearborn st., from 10th to 16th sts., has been confirmed.

South Bend, Ind.—Resolutions for pavement of the first alley north of La Salle ave., from Lafayette st. to first alley west, and pavement of the first alley west of Lafayette st., from Madison st. to La Salle ave., have also passed.

Vincennes, Ind.—City Civil Engineer has been asked to prepare resolution calling for improvement of Parkinson st., from 13th st. to 15th st.

Algona, Ia.—Resolution for paving State st. is being considered.

Fort Dodge, Ia.—Resolution of necessity has been adopted for macadamizing West Fort Dodge hill, from Bennett viaduct to top of bluff.

Hamburg, Ia.—Council has authorized paving and curbing of various streets and alleys.

Iowa Falls, Ia.—About 30,000 sq. yds. of cement paving will be laid.

Leavenworth, Kan.—Ordinance to curb, regrade and pave Cherokee st., between Broadway and Grand ave., and to pave alley in Day's subdivision, has been passed.

Barbourville, Ky.—County Good Roads Association will be formed in Knox County during next few days and agitation will be started for bond issue to build good roads in various parts of county. In Bell County vote will be taken next fall on \$600,000 issue of bonds for road construction.

Elkton, Ky.—Vote is being considered for proposed \$200,000 bond issue for building of pikes.

Lexington, Ky.—Ordinances have been passed ordering construction of East High st., from Rose st. to Ashland ave.; Woodland ave., from Main to Maxwell, and Walnut, from Barr to Fifth st., with improved paving material.

Louisville, Ky.—Bids have been opened by Board of Public Works on paving of Fulton st., from Mill to Cabel sts., with granite block at estimated cost of \$9,000. L. W. Hancock & Co. bid \$3 a sq. yd.; Henry Bickell Co., \$3.25 a sq. yd.; G. W. Gosnell Co., \$3.30 a sq. yd.

Whitinsville, Mass.—It has been voted to appropriate \$4,500 for improvement of Church st. with macadam, with a bituminous dressing of local granite.

Grand Rapids, Mich.—Bids will be received at this office until 11 o'clock a.m., June 6, for purchase of \$200,000 road construction bonds of county of Kent, Michigan. Ralph A. Mosher, County Clerk.

Austin, Minn.—Improvements of roads is being planned by city and county.

Chisholm, Minn.—Council is contemplating paving of Lake st. at cost of \$30,000.

Hibbing, Minn.—Lake st. has been ordered paved from Fourth ave. to lake; estimated cost, \$35,000.

Yazoo City, Miss.—Expenditure of \$75,000 of bonds for good roads is being discussed.

Hannibal, Mo.—Plans to build permanent good roads and bridge all creeks with permanent structures have been inaugurated by Louisiana Commercial Club. Pike County will add many miles to present highways.

St. Louis, Mo.—Board of Public Improvements has approved proposed ordinances to improve and reconstruct several streets, among them being provisions for wood block paving on Olive st., from 12th to 14th.

Sedalia, Mo.—Commissioners of Sedalia 12-mile special road district has sold to A. G. Edwards & Son, of St. Louis, \$190,000 bonds at par and a premium of \$2,011.

Billings, Mont.—City will purchase new street flusher.

Atlantic City, N. J.—New specifications for paving of Congress, Tallahassee and other avenues with asphalt, bitulithic and brick, wood block and other materials, have been ordered.

Elizabeth, N. J.—Petition to have Broad st. paved will be presented to City Council.

Montclair, N. J.—In secret session Roads and Sewers Committee of Montclair Town Council considered proposed paving of Orange rd. and Upper Mountain ave. No final action, it is said, was taken, but it was estimated that total cost of proposed improvement would be \$195,000.

Newark, N. J.—Paving of Harrison st. is being considered.

Newark, N. J.—Complaints from residents in West Orange have caused steps

to be taken to obtain additional funds with which to oil roads. As \$10,000 placed in county budget for this purpose and emergency repairs will not be available immediately, it was decided to ask for appropriation of \$1,200. It was further decided that county roads be restricted for oiling purposes. Bids will be asked for further oiling and bidders will be obliged to specify figures for which oil will be placed on roads, and not bid on oil delivered to central points, as has heretofore been the case.

Newark, N. J.—Board of Freeholders of Bergen County has ordered paving of Schuyler ave., county road extending through North Arlington, Union Township, Rutherford, East Rutherford and Carlstadt to Hasbrouck Heights. Same thoroughfare continues along western edge of meadows of Arlington and Kearney, emerging at Harrison turnpike on south. Avenue will be made 50 ft. wide its entire length.

Orange, N. J.—Steam roller may be purchased.

Orange, N. J.—Committee has decided to purchase carload of 40 per cent. asphalt road oil for laying dust on streets where traffic is very heavy.

Albany, N. Y.—In all State Highway Commission has ordered advertisement for 900 miles of new highways. They will cost about \$12,000,000. Following in northern New York are in list: Watertown-Theresa, part 2; Clayton-Alexandria Bay; Henderson Village; Watertown-Clayton, part 3; Watertown-Clayton, part 2; County Line-Adams Center; Potsdam-Nicholville; Morristown-Hammond; part 2; Gouverneur-Dekalb; County Line-Gouverneur; Potsdam-Norwood, and Road 1033, Ogdensburg city; Potsdam village; Ogdensburg-Morristown, part 2; Potsdam-Parishville, part 2; Morristown-Hammond, part 1.

Rochester, N. Y.—Plans for construction of street parallel to Main st. to number of four or five will be prepared in office of City Engineer Edwin A. Fisher, and ordinances to carry out plans will also be drawn.

Rochester, N. Y.—Two ordinances will be introduced and referred to committees. One will provide for extension of Mortimer st. and other the extension of Pleasant st.

Rochester, N. Y.—Ordinances have been prepared to provide for construction of streets parallel to Main st., from Elizabeth st. to Clinton ave. north. Estimated cost of proposed thoroughfare is \$1,500,000.

Tuckahoe, N. Y.—Village has recommended use of Sicilian asphalt pavement on stretch of White Plains road within village limits, which is to be improved by State as part of Route No. 1.

Fayetteville, N. C.—Cumberland County has voted bond issue of \$200,000 for good roads.

Cincinnati, O.—Surveyor has reported estimated cost of resurfacing Ohio pike, from Mount Washington to Clermont County line, at \$10,280.

Harrisburg, Pa.—Ordinances have been passed authorizing paving and curbing of Summit st. and Atlas st.; opening and grading of Front st. and grading of Green and 19th sts. Chas. A. Miller, Clerk of Common Council.

Marion Heights, Pa.—Council has decided to improve streets of city.

Newport, Pa.—Borough Council has decided to have Second and Walnut sts. paved with vitrified brick.

Sharon, Pa.—Ordinance has been passed providing for extension of Third st. in Borough of Sharon, from south line of Silver st. southward to north line of State st.

El Paso, Tex.—Overland st. will be paved from intersection of Campbell st. to Cotton ave.

El Paso, Tex.—County Commissioners have ordered construction of macadam road about quarter of mile in length, extending from George Buchanan's place on county road to railroad station. They also ordered construction of two miles of macadam road, from town of Socorro to county road, down valley.

Fort Worth, Tex.—Petition has been granted for paving Belmont st., between 15th and Park ave.

Fort Worth, Tex.—City Commission has referred petition for opening of streets from Morgan to Luella st., distance of 266 ft., to Commissioners.

Port Arthur, Tex.—Efforts are being made here to improve road along Gulf Beach, between Sabine and High Island, for use of automobiles and intended to be highway between Beaumont, Port Arthur and Galveston.

Waxahachie, Tex.—Tax payers of Palmer precinct have voted on proposition of issuing \$75,000 worth of bonds for construction of pike roads. Proposition was adopted by a vote of 167 for to 74 against.

Brigham City, Utah—Bids for purchase of county's road bonds in sum of \$175,000 have been opened. Award was made to N. H. Halsey & Co., of Chicago.

Ogden, Utah—At meeting of County Commissioners it was decided to improve road south of Riverdale and road in Weber canyon, leading to Morgan County line. This road leads to State road decided on recently through Echo canyon and across Morgan County.

Alexandria, Va.—Resolution appropriating sum of \$3,850 for opening, grading, paving and curbing Peyton st., between King and Cameron sts., has been passed.

Alexandria, Va.—Ordinance to narrow width of Washington st., from Queen to Duke sts., distance of four squares, reducing it from 64 to 56 ft. has been passed.

Bristol, Va.—City Council of Virginia Bristol has voted \$5,000 aid to movement to build macadam road between this city and Abingdon.

Portsmouth, Va.—Paving of Chestnut st. to Race ave. is being discussed.

Richmond, Va.—Special appropriation has been recommended for smooth paving of West ave.

Richmond, Va.—Bids have been opened for first-class granite paving on Main st., between Fifth and Seventh sts., bids being received from Messrs. Cheatwood, Weinbrun, Barry and Smith, Mr. Cheatwood being apparently lowest bidder. Bids were referred to City Engineer with instructions to award contract to lowest responsible bidder.

Richmond, Va.—Bids have been opened by Committee on streets for repaving of Broad st., from 10th st. westwardly, and referred to subcommittee for tabulation and report. Bids were received for asphalt block, first-class granite, creosoted wood block, improved sheet asphalt and Warren's bitulithic. Each bidder submitted his estimate on unit system, so much per cu. yd. for paving, so much for excavation, filling and concrete base. For asphalt block it appeared that I. J. Smith & Co. were lowest bidders, only other competitor being Washington Asphalt Block & Tile Co. For first-class granite paving bids were submitted by I. J. Smith & Co., Weinbrun & Co., and Charles Gasser, it appearing that latter was lowest bidder. Messrs. Smith, Weinbrun and Gasser also bid on creosoted wood block paving, Smith appearing to be lowest. For improved sheet asphalt there was bid from Crawford Co., and on Warren formula of bitulithic paving from Atlantic Bitulithic Co.

Scottsville, Va.—Bond issue of \$100,000 for road improvements is proposed.

Ritzville, Wash.—County Commissioners plan to spend about \$30,000 on roads and bridges in this county during coming year. Bids will be asked for in near future for two miles of macadamized road from Lind southeasterly. Road will also be built from Washtucna north. Six steel bridges will also be built.

Tacoma, Wash.—County Commissioners have practically decided to re-advertise for bids for construction of permanent highway No. 1.

Tacoma, Wash.—Municipal Commission has ordered work started at once on South Tacoma hard surface boulevard from city limits at 80th st. to 36th and Warner sts. Improvement will cost about \$102,000.

Tacoma, Wash.—Resolution providing for improvement of Sixth addition hard surface road, from 58th st. along route of South Tacoma electric line to Union ave. and 54th st., will be introduced before Municipal Commission.

Morgantown, W. Va.—Appropriation of \$10,000 has been made for road improvement between city line and Sabraton tin mill.

Ashland, Wis.—County Board has authorized issuance of \$65,000 bonds to be expended in improvement of county highways and erection of a combined jail and sheriff's residence.

CONTRACTS AWARDED

Pine Bluff, Ark.—For paving West Fifth ave., from Main st. to Cotton Belt Railroad, about 25 blocks, to Levy & Levy, of Muskogee, for \$23,000. Asphaltic rock will be used.

Coalinga, Cal.—To Worswick St. Paving Co., of Fresno, at \$23,000, for paving of E st., its bid being 1½ cts. per sq. ft. for grading, 17 cts. per sq. ft. for

paving, 60 cts. per lin. ft. for curbing, 25 cts. per sq. ft. for gutters and \$1.10 per lin. ft. for culverts.

Los Angeles, Cal.—To Withers & Crites, at \$6,020, for grading and graveling and constructing cement curbs, gutters and sidewalks in New Orleans st. To Fairchild-Gilmore Wilton Co., at \$36,996, for brick and asphalt paving, and constructing cement curb and gutter, granite block, gutter and storm drains in Alvarado st., between Seventh and Pico sts. To Fairchild-Gilmore Wilton Co., for improving Wall st., from Seventh to Pico sts., at 16 cts., for paving, 30 cts. for cement curb, 28 cts. for vitrified block gutter, 40 cts. for granite block gutter and \$165 and \$200 for culverts. To Benjamin F. Ford, at \$6,721, for asphalt paving and constructing cement curbs and granite block gutters in Scarff st. To George R. Curtis, at \$8,236, for grading, graveling and constructing cement curbs, gutter, sidewalk and granite block gutter in Ivanhoe ave., from Cove ave. to Alessandro st. To Barber Asphalt Paving Co., at \$4,531, for paving and constructing cement curb, granite and vitrified block gutter and storm drains in Alpine st., from Figueros to Beaudry sts.

Santa Barbara, Cal.—To Santa Barbara Paving & Grading Co., at \$9,100, for constructing cement curbs and gutters in E. Haley st., from State to Milpas sts.

Kankakee, Ill.—By City Council, for construction of brick pavement on West Court st., to John Hays Sons Co., at \$23,807. E. J. DesLauries is City Clerk.

Bloomington, Ind.—By Commissioners of Monroe County, for construction of stone road in Salt Creek Township, to Ralph Hanna, of Bloomington, at \$11,300.

Muncie, Ind.—By City, for construction of brick roadway in Washington st., from east line of Washington st. bridge, east to west line of High st., to M. M. Guinnup, a local contractor. His bid called for Deckman Duty brick and his figure for work was \$6,642.34. For construction of paved roadway in Walnut st., from north line of Willard st. to brick paving at Second st., to William M. Birch, whose bid was \$2,133.56.

South Bend, Ind.—To Hugh Anderson, for building of grades, curbs and walks on Corby st., from Notre Dame to Walsh st., for \$1,545.60.

Grundy Center, Ia.—To Geo. Gabler, Mason City, for 45,000 sq. yds. of paving at \$1.08.

Paducah, Ky.—By McCracken County Fiscal Court, for repairing county roads: Houser rd., T. Houser, 55 cts.; Collier-ville rd., Thomas Challenber, 48 cts.; Broadway, Harry Ross, 54 cts.; Mayfield rd., from the Moss home to the city limits, W. L. Yancey, 44 cts.; same road, from Moss home to the county line, H. Ballance, 45 cts. Following contracts were awarded for grading direct roads, as follows: Fifth district, Oscar Rawlinson, \$8 per mile; sixth district, W. L. Yancey, \$10 per mile; seventh district, Harry Ross, \$12.75 per mile; eighth district, R. M. Ross, \$14.45 per mile; Clinton rd., Harry Ross, 54 cts.; Potter rd., Harry Ross, 57 cts.; Blandville rd., Harry Ross, 58 cts.; Pines rd., Harry Ross, 85 cts.; Benton rd., S. B. Gholson, 60 cts.; Calvert City rd., Oscar Rawlinson, 40 cts.; Cairo rd., Major Wood, 55 cts.; Pool rd., Gottlieb Beyer, 45 cts.; Hinkleville rd., Harry Ross, 75 cts.; Clinton rd., Harry Ross, 50 cts.; Friendship rd., Harry Ross, 50 cts.; Woodville rd., A. Kuykendall, 85 cts.

West Shreveport, La.—To Southern Bitulithic Co., for paving of Cedar st., from Texas ave. to Park ave., and Park ave., from Cedar to Caperton st., at \$1.84 per sq. yd., and for paving of Laurel st., from Madison ave. to Harriett ave., at \$1.65 per sq. yd.

Bangor, Me.—By City Council, for street sprinkling, to J. Frank Green. Bids were as follows: J. Frank Green, streets, from 15 to 20 ft. wide, 3 cts. per ft.; 21 to 24, 4 cts.; 25 to 30, 5½ cts.; 31 to 35, 7 cts.; 36 to 40, 4 cts.; 41 to 45, 7 cts. Murtagh Hughes, 15 to 20, 3½ cts.; 21 to 25, 5½ cts.; 26 to 30, 6½ cts.; 31 to 35, 7½ cts.; 36 to 40, 8 cts.; 41 to 45, 8½ cts.

Hudson, Mich.—By City Council, for paving of Grove st., Main st. and Maple Grove ave., to Marsman & Green, Grand Rapids, at \$31,000. F. P. George is City Clerk.

Ironwood, Mich.—For constructing 20,000 sq. yds. rock macadam pavement, to O. C. Sutherland, of Ironwood, for \$13,275. W. D. Snyder is City Clerk.

Benson, Minn.—To E. C. Fosdyke, of De Graff, Minn., for work on State Rd. No. 1, at 16 cts. per cu. yd.

St. Joseph, Mo.—To M. Costello, by County Court, for grading of Sparta, Faucett and James Stafford rd., which will make continuous graded way from St. Joseph to south county line, about 16 miles. Contract price is 13¼ cts. a cu. yd. for all material removed. Road will be made as nearly level as topography will permit. Cost is estimated at \$30,000. Court also awarded to Young Bros. contract for DeKalb rock rd., at 97½ cts. a lin. ft. This work will cost about \$40,000.

Helena, Mont.—To Smith & Saner, for brick paving on Helena ave., at \$13,343. Louis Johnson received contract for brick paving on Railroad st., at \$23,331. Mr. Johnson also received contract for improving Davis st., at \$4,438, and for sewer on Lawrence st., at \$1,688.

Mt. Holly, N. J.—To Field, Barker & Underwood, of Philadelphia, Pa., for following work: Broad st.—480 cu. yds. grading, 30 cts.; 2,987 lin. ft. curb, 12 cts.; 1,298 sq. yds. rubble gutters, 25 cts.; 5,111 sq. yds. 6-in. macadam roadway, trap rock, 72 cts. Madison ave.—1,300 cu. yds. grading, 40 cts.; 4,362 lin. ft. curb, 12 cts.; 2,012 sq. yds. rubble gutters, 25 cts.; 6,266 sq. yds. 8-in. to 6-in. macadam roadway, trap rock construction, 75 cts. Garden st.—Removing and hauling rubble paving, 10 cts. sq. yd.; relaying 856 sq. yds. rubble gutters, 25 cts.; 4,582 sq. yds. 6-in. macadam roadway, trap rock construction, 73 cts. Pine st.—Relaying 4,542 sq. yds. cobble pavement and flag gutter, 18 cts.; 4,542 sq. yds. amiesite roadway (amiesite furnished by township on cars), 19 cts.; and Mill st.—Relaying 3,251 sq. yds. rubble and cobble pavement and flag gutterways, 18 cts.; 3,084 sq. yds. amiesite roadway, 19 cts.

Paterson, N. J.—By Freeholders, for improvement of about 50 county roads. Successful bidders and roads they will improve are as follows: W. H. Ring, Cedar Cliff rd., Long Hill rd., Market st.; McKiernan & Bergin, Rifle Camp rd., Madison ave.; Barret Manufacturing Co., 17th ave., Washington pl., Van Houten ave., Great Notch rd., 14th ave., 15th ave., River rd., Jackson st.; George F. Brackett, Lexington ave.; J. S. Sowerbutt, Fifth ave., Clifton ave., Third st., Highland ave., Godwinville rd., Wagaraw rd., Crooks ave.; Philip Kramer, East 18th st., Bloomfield ave.; W. A. Ferguson, Little Falls turnpike, Singac rd.; Wayne Contracting Co., Hopper st., North Eighth st., Pompton rd.; Jackson lane, Francesco Bros.; Colfax & Steel, Oakland rd.; Samuel Braen, Hamburg ave.

Auburn, N. Y.—For about 9,400 sq. yds. brick paving on Franklin st., to John C. Healey, of Auburn.

Gloversville, N. Y.—By City Council, to Baker & Banker, Gloversville, at \$102,114, for paving various streets in city.

Rochester, N. Y.—or flushing Lyell ave. and Child st., to Lewis A. Ackerman, for \$603.50 and for asphalt pavement in Berwyn st., to Rochester Vulcanite Co., for \$3,614.

Westfield, N. Y.—By City, for 828 sq. yds. of paving, to Geo. Offenbacher, North East, Pa., at \$2,081.06. Other bids were as follows: Schultz Bros., Fredonia, N. Y., \$2,130.80; Love & Son, Cory, Pa., \$2,563.94; Tony Millitello, Westfield, N. Y., \$2,168.80; A. J. Corrigan, Jamestown, N. Y., \$2,252.20; Peter Collato, Westfield, N. Y., \$3,142.26. For 648 lin. ft. of concrete curbing, to Geo. Offenbacher, at 45 cts. per ft. J. A. Riley, Clerk.

Cleveland, O.—To Enterprise Paving & Construction Co., Cleveland, at \$44,241, for improvement to N. Woodland rd. Road will be paved with Medina block.

Coshocton, O.—By City, for grading and paving with bituminous surface treated waterbound macadam Walhonding-New Gilford rd., to Chas. Bird, Springfield, O., at \$16,170. Length, 12,505 ft., or 2.37 miles.

Hamilton, O.—To George W. Rich, Loveland, at \$6,589, for improvement under Specification No. 297, of Falls rd., from Union Cemetery rd. to Rich rd., in Symmes.

Logan, O.—To Huston & Henderson, Logan, at \$17,463, for grading and paving with concrete, Section 1 of Logan-Enterprise rd. in Falls Township. Road will be 8,400 ft. or 1.59 miles long and 14 ft. wide. Engineer's estimate was \$14,151. James R. Marker, Columbus, is State Highway Commissioner.

Wilmington, O.—To Weldon N. McKay, Bert Bloom and John A. Conner, Wilmington, O., at \$22,975, for grading and paving with waterbound macadam, Wilmington-Xenia rd. in Union, Clinton County. Road will be 20,750.4 ft. or 3.93 miles long and 14 ft. wide. Engineer's

estimate was \$23,140. James R. Marker, Columbus, is State Highway Commissioner.

Youngstown, O.—By Commissioners of Mahoning County, to C. W. Harshman, Mineral Ridge, O., at \$12,074, for grading and paving Section 2 of Ellsworth Center Easterly rd. in Ellsworth Township.

Youngstown, O.—By Board of Control, for paving Mt. Pleasant st., to Jas. McCarron, at \$17,276. Kennedy Bros., of Youngstown, are stated to have secured contract for paving With brick Earle ave., for \$12,474.

Youngstown, O.—By Board of Good Roads Commissioners, for improving roads on which bids have been opened. Unless some serious objection develops the work will go to lowest bidders, which are as follows: F. M. Hannon, for two sections of the Boardman rd. (brick), his figures being \$18,614.24, section 2, from the Pleasant Grove rd. to Geiger's, 7,600 ft., and \$14,635.50 for section 3, the rest of the distance to Boardman Center, 6,000 ft.; G. A. Gialdini & Co., for section 2 of the town line rd. between Youngstown and Austintown (macadam), from Perline Corners to Ribblets Corners, 10,110 feet, \$14,899.73; E. J. Kane, for section 3 of the same road from Burkey rd. to Carnersburg, 9,688 ft., \$17,199.55; Ross O'Rourke, for section 2 of the Raccoon road (macadam), Austintown township, from section 1 to Handiworks Corners, 5,342 ft., \$9,278.72.

West Chester, Pa.—By West Chester Council, to macadamize several streets, to Farrel Bros., for \$3,945.

Fall River, E. I.—For furnishing city with 225,000 paving blocks, as follows: Nelson A. Bennett, Sterling, Conn., 25,000 blocks, figuring \$1.68 per sq. yd.; Saye & Jackson, 75,000 blocks, figuring \$1.71½ per sq. yd.; Willard M. Petty, 125,000 blocks, figuring \$1.80 per sq. yd.

Fort Worth, Tex.—For paving, to Texas Bitulithic Co., as follows: Seventh ave., from south line of Pennsylvania ave. to its intersection with Fruit st.; East Leuda st., from east line of Kentucky ave. to the west line of Loney st.; New York ave., from south line of Terrell st. to south line of Maddox st. Contract price for three streets is \$2.08½ per yd. for paving and 40 cts. per cu. yd. for excavation.

Portsmouth, Va.—For paving of Chestnut st., from Glasgow to South sts., to Perry W. Ruth.

Richmond, Va.—To Charles Gasser, for granite paving on Allen ave., Cary and other streets; to Washington Asphalt Block & Tile Co., for smooth paving on Grove ave., to cost \$25,000.

Glendale, W. Va.—For paving County rd. through Glendale, to Rosser & Maloney, of Bellaire, for about \$12,000.

Warwood, W. Va.—To William P. Daniels, of South Warwood, for laying about 500 ft. of four-ft. sidewalk on north side of 19th st., between Main and Richland aves.

Racine, Wis.—J. Cape & Son are lowest bidders on paving Grand ave. Their bid was \$1.75 for brick; asphalt block, \$1.88, and Purington brick, \$1.80.

SEWERAGE

Los Angeles, Cal.—Complete plans and estimates for comprehensive system of storm drains and outfall sewers adequately to protect Los Angeles from overflow of storm water and provision for outfalls for all existing and proposed sewer districts, all involving total cost of \$9,300,235 to districts involved, have been approved by Board of Public Works. Plans and estimates were submitted by Homer Hamlin, City Engineer.

Wood River, Ill.—It is planned to expend \$27,320 for sewer system.

Indianapolis, Ind.—Resolutions have been adopted for construction of sewers in various streets.

South Bend, Ind.—Resolutions for sewers on South Eddy, South Main st. and Mishawaka ave. have been passed by Board of Public Works. Eddy st. drain will extend from Jefferson blvd. and Eddy st. to Eddy and Division sts. Mishawaka ave. sewer will start at 16th st. and run to Eddy st., while Main st. drainage will extend from Indiana and Ewing aves.

Vincennes, Ind.—Board of Public Works has asked City Civil Engineer to make survey of territory in vicinity of Emison ave. with view of arranging for system of storm water sewerage for future protection of district.

Des Moines, Ia.—Council has authorized construction of sewer in University ave., Cottage Grove ave. and Forest ave.

Fort Dodge, Ia.—Construction of two sanitary sewers have been ordered. One begins at 10th ave. south and Sixth st. east to Seventh st., north on Seventh to Commerce st., thence west to Sixth st., thence north to alley between Commerce st. and Fourth ave. south. The other is on Sixth ave. north, from 13th to 15th sts.

Red Oak, Ia.—Construction of 2,900 ft. of sewers has been authorized.

Opelousas, La.—Construction of complete system of sanitary sewers, comprising about 10 miles of 18- to 6-in. pipe sewers has been authorized. Walter G. Kirpatrick, Engineer, 703 Farley Bldg., Birmingham, Ala.

Bayonne, N. J.—Construction of sewers in W. 54th st. has been ordered.

Dover, N. J.—Expenditure of \$250,000 is contemplated for sewers.

Roselle Park, N. J.—Construction of sewer in Chestnut st. is being considered.

Kingston, N. Y.—Ordinance has been passed for construction of sanitary sewer in portion of Washington ave. John T. Cummings is City Clerk.

Niagara Falls, N. Y.—Board of Public Works has approved of sewer work that will require outlay of \$66,500 and will call for bids on the work.

Pearl River, N. Y.—Village is considering sewerage system.

Saranac Lake, N. Y.—Five miles of new sewers are contemplated by Board of Water and Sewer Commissioners, and estimates are now being made on cost of proposed work.

Akron, O.—Legislation to parallel and to rebuild troublesome Glendale sewer, from Willow st. to South st., will be started by Council. It is intended that present 24-in. sewer will be allowed to remain until proposed five-ft. brick sewer is constructed.

Springfield, O.—Ordinance has been passed under suspension of rules to issue bonds in sum of \$161,228.15 for purpose of constructing Indian Run storm water sewer. Ordinance has also been passed under suspension of rules to issue bonds in sum of \$63,252.20 for purpose of constructing Wheldon ditch storm sewer, and in sum of \$9,085.20 for purpose of constructing storm water sewer in Henry st., Lagonda ave. to Lowell st., and in Lowell st. to ditch, and in ditch to Buck st.

Collingdale, Pa.—Ordinance has passed first reading in Collingdale Council considering an increase in borough's indebtedness of \$40,000 for constructing system of sewers.

Dunmore, Pa.—Ordinance providing for building of Section T sewer at estimated cost of \$5,600 has been passed.

Hazleton, Pa.—Plans and specifications for proposed new sewer on Oak and Green sts. to city line, as drawn up by Borough Engineer Moore have been approved. Distance will be 898 feet, and 16-in. pipe will be used.

Amarillo, Tex.—Extension of sanitary sewer system has been decided on. C. T. Mueller is Engineer.

Dallas, Tex.—Recommendations for sanitary sewers in various districts of city to connect 114 houses with sewer lines have been made.

Fort Worth, Tex.—Construction of sewers is being considered.

Leesburg, Va.—There will be special election on June 4 on question of bonding town for sewerage and water system, and for taking up \$10,000 in 6 per cent. bonds, known as the Town Hall bonds.

Fond du Lac, Wis.—Council ordered sanitary sewer system for west side and construction of a sewer disposal plant.

CONTRACTS AWARDED

Mason City, Ia.—For construction of sewers in Columbia and Barragut sts., to S. R. Bowen, as follows: Earth excavation, at 48 cts. per cu. yd.; loose rock, \$1.50; hard rock, \$4; 8-in. pipe, 20 cts. per lin. ft.; six 8-in. Ys, \$1; manholes, \$45.

Boston, Mass.—For construction of sewer in Cabot st., Roxbury District, by Louis K. Rourke, Commissioner of Public Works, to McCarthy & Walsh, East Boston, at \$9,725. Other bids were: M. de Sisto & Co., \$9,735; John McCourt & Co., \$9,832.

New Ulm, Minn.—By City Council, to E. T. Webster, St. Paul, for construction of sewers on State st., from Second st. to South Sixth st.

Willmar, Minn.—By city, for constructing sewer system complete, including septic tank, sludge beds, etc., to W. B. Bosworth, of Ada, for \$27,500. Other bidders: F. Desournaux Constr. Co., Mankato, Minn., \$33,500; Henry Welzium, Dows, Ia., \$32,500; L. W. Schrut, Fargo, N. Dak., \$33,600; Pastoret-Lawrence Co.,

Duluth, \$37,900; G. S. Redmond, Pipe-stone, \$29,930; Fraser & Danforth, St. Paul, \$32,000; J. H. Roberts, Brookings, \$32,200; Paulson Ditching & Constr. Co., Cottonwood, \$25,831 (without tank); Peterson & Geer, Willmar, \$3,500 (for tank only).

Newmarket, N. H.—By Sewer Commission, for constructing sewerage system, to Frank Marcello, of Portsmouth, as follows: 6-in. sewer, 4,205 ft., 45 cts.; 8-in. sewer, 7,650 ft., 60 cts.; 10-in. sewer, 900 ft., 90 cts.; 12-in. sewer, 500 ft., 95 cts.; 15-in. sewer, 100 ft., \$1.25; 18-in. sewer, 100 ft., \$2; 59 manholes, each, \$37; 300 ft. 48-in. brick sewer, \$4.50; or 300 ft. 48-in. concrete sewer, \$4; 250 cu. yds. rock excavation, \$3.60; total, \$12,525.

Cheektowaga, N. Y.—For constructing sewers in town of Cheektowaga, and sewage disposal plant on bank of Buffalo Creek, town of West Seneca, requiring approximately 20,327 lin. ft. 10 to 36-in. vitr. tile sewer, disposal plant, etc., from plans of Geo. C. Dehl, Town Engineer, 552 Elliott sq., Buffalo to Fred Mumm, of Buffalo, for all except 1,000 ft., at \$36,284; to Wm. Weiberg, Cheektowaga, 1,000 ft., for \$1,826, and to Hydro Contrs. Co., Buffalo, for disposal plant, at \$13,677.

Elmira, N. Y.—For sewer construction, by Board of Public Works, as follows: Hoffman st. sewer, to Connors & Gallavan, at 51 cts. per lin. ft.; John st. sewer, to E. W. Walsh, at 50 cts.; West First st. sewer, to John C. Costello, at 76 cts.

Middleport, N. Y.—For construction of sewer system and sewage disposal plant, to Cusano & Dower, Niagara Falls, at \$36,727.

Newark, N. Y.—For construction of Section 15 of intercepting sewer, by Passaic Valley Sewerage Commission, to Stephen Flanagan & Son, Scranton, Pa., at \$70,000.

Rochester, N. Y.—To F. V. Brotsch, for construction of sewer laterals in Morton st., for \$907.50.

Massillon, O.—For construction of sewers, as follows: Wetmore st., Frank Kraft; South, Dwight, Denner, Wooster, Lincoln and Walnut sts., Kraft & Schott.

Everson, Pa.—For constructing 16,020 ft. pipe sewers at Everson, to I. R. Fike, of Uniontown, for \$10,569.

Philadelphia, Pa.—For sewer construction, by Director of Public Works, as follows: Rock Run sewer, to Cantrell Construction Co., S. 5th st., Philadelphia, at \$17,495; Cohocksink main sewer, Emilio Puscuzzi, at \$62,596; Delaware ave. sewer, John McMenamy, Harrison Block, Philadelphia, at \$29,365.

Cuero, Tex.—By City Council, for constructing of sewer system, to Fountain & Shaw, of Dallas. J. W. Benjamin is City Engineer.

Kennewick, Wash.—For installing city sewer system, to Northwest Constr. Co., of Spokane, for \$37,899.

Beaver Dam, Wis.—By Committee on Streets, to H. C. Reomming, city, for construction of sewers.

Hartford, Wis.—To A. C. Schreiter, Manitowoc, Wis., for laying and furnishing pipes, manholes, lampholes, etc., at Hartford.

Owen, Wis.—To August Senn and Ole Bason, Marshfield, Wis., for laying 1,950 ft. of 24-in. vitrified pipe sewer, six manholes, one catch basin, etc.

Superior, Wis.—Russell Construction Co. with its bid of \$45,533 for brick, and \$24,533 for concrete, is lowest bidder for construction of proposed main sewer at Billings Park. Sewer is to extend from Susequehanna to Elmira aves. and is located in alley south of Belknap st. Magnus Peterson was second lowest bidder, at \$26,547.42. Other bidders were: Johnson & Johnson, Stack Bros. Co., A. J. McDonald, John Anderson and Peter Bergman & Co. The bids were referred to City Commission for action. J. B. Palmer was lowest bidder for construction of small sewer in alley between 21st st. and Lincoln st., extending from Clough to Weeks ave. Palmer bid \$477.74. J. O. Anderson was awarded contract for construction of sewer in alley between Clough and Weeks ave., running south from end of present sewer. Bid was \$646.

Edmonton, Alta, Can.—To Manders & Gregory, for Nelson ave. sewer, at \$22.30 per lin. ft. for 54-in. sewer and \$15 for manholes. B. Johnson was awarded contract for catch basins. Cost, \$240.83.

WATER SUPPLY

Los Angeles, Cal.—Board of Public Service Commissioners will shortly install new system of making extensions of water mains.

Johnstown, Col.—Johnstown will hold election to vote \$20,000 in bonds for construction of water system.

Herrin, Ill.—City Court has confirmed special assessment for construction of water works at estimated cost of \$60,000. Contract is to be awarded June 3.

Wood River, Ill.—It is planned to expend \$28,355 for water system.

Woodstock, Ill.—Extension of water works system is contemplated.

South Bend, Ind.—Sum of \$200,000 will be expended in water works improvements.

Charles City, Ia.—Sum of \$50,000 will be voted by city for pumping station, etc.

Defiance, Ia.—Special election will be held June 8 for voting on \$8,000 bond issue for installation of water works system.

Estherville, Ia.—Installation of filtration system to cost \$15,000 is being considered.

Waterloo, Ia.—Additional water mains for about one mile will be laid in Westfield addition, to cost about \$10,000.

Topeka, Kan.—Reservoir of 2,000,000 gallons capacity is being considered by Water Works Department.

Madison, Ky.—City will install new water works system.

Mt. Sterling, Ky.—At special session of City Council franchise for term of 20 years for water and light was sold for \$100 each to Water, Light & Ice Co., of this city.

Millers Falls, Mass.—Sum of \$8,000 has been voted for water supply.

Detroit, Mich.—Extension of water system is being considered. Prof. Williams, of University of Michigan, recommends construction of additional intake pipe, three new high pressure engines for pumping plant, and several new water mains of large capacity. Estimated cost of improvement is \$4,000,000.

Barnesville, Minn.—All bids have been rejected for extension of water mains.

Virginia, Minn.—Virginia Electric Power & Water Co. plans making improvements that will mean an expenditure of nearly \$50,000 in extensions of and additions to mains and in sinking third deep well.

Biloxi, Miss.—Final ordinance in water works bond issue of \$70,000 has been passed at meeting of City Council.

Pleasant Hill, Mo.—Construction of municipal water works has been voted for.

Central Valley, N. Y.—Town of Woodbury is to have new source of water supply at cost of from \$30,000 to \$50,000, according to arrangement made at conference between representatives of town and directors of Commonwealth Water Co.

Rochester, N. Y.—Water works improvements to cost about \$1,500,000 have been authorized at meeting of Common Council.

Watervliet, N. Y.—Bids will be advertised for installation of water system.

Cavalier, N. Dak.—Installation of municipal water plant is contemplated.

Akron, O.—Every voter in Akron is urged to vote for \$1,225,000 bond issue so that city may go ahead in building its reservoirs, laying pipe line from new source of supply and thus making it possible for Akron to carry out its work of building modern water plant.

Dayton, O.—Bids will be received at office of City Auditor until 12 o'clock noon, June 21, for sale of bonds in amount of \$25,000 for purpose of providing fund for improvement and extension of the water works system by erection of standpipes and installation of check valves in that portion of city known as Dayton View and Riverdale. G. W. Bish, City Auditor.

Youngstown, O.—Plans for improvements to filter plant costing approximately \$125,000 have been completed by City Engineer and forwarded to State Board of Health for approval.

Webbers Falls, Okla.—Bonds in sum of \$17,000 have been sold for extension of water works.

Union, Ore.—Improvement of water system has been planned; estimated cost \$12,000.

Barnwell, S. C.—Bond issue of \$22,000 has been voted for installing water and light plant.

Canton, S. Dak.—Council has ordered construction of five blocks of water mains.

Dallas, Tex.—Bids will probably be asked for shortly on new 36,000,000-gallon pump.

Irene, Tex.—Installation of water works system is being considered.

Payson, Utah.—Installation of new water works system is planned.

Leesburg, Va.—There will be special election in Leesburg on Tuesday, June 4, on question of bonding town for \$30,000 for purpose of changing present in-

adequate water system into gravity system; also for sewerage system.

Chehalis, Wash.—Installation of gravity water system has been voted; bonds for \$185,000 have been voted.

Huntington, W. Va.—People have voted in favor of new water system to cost about \$800,000.

Appleton, Wis.—Sum of \$200,000 in bonds will be issued for improvements to water works system. Fifteen miles of new mains will be installed.

Manitowoc, Wis.—Improvements to water works system, to cost from \$26,000 to \$30,000, have been authorized.

CONTRACTS AWARDED

Southington, Conn.—By Board of Water Commissioners, for laying approximately 21,000 ft. of 12, 8 and 6-in. c. i. pipe and appurtenances, to Hartford Paving & Constr. Co., of Hartford, for \$6,591. Other bidders: A. Coti & Co., Hartford, \$6,992; Lapardo & Way, Springfield, Mass., \$7,379; Tony Lambo, Waterbury, \$8,218; G. B. Rico, New Haven, \$8,535; Coyne Constr. Co., New Haven, \$9,121; F. L. Ley Co., Springfield, Mass., \$9,548; Jas. Page, Mt. Vernon, N. Y., \$9,698; L. Suzio, Meriden, \$10,228; Pierson Engineering Co., Hartford, \$10,352; H. S. Spiniach Constr. Co., Waterbury, \$11,608; C. W. Tryon, Meriden, \$10,315; Dinnen & Son, East-hampton, Mass., \$11,924; A. G. Malligan, New Rochelle, N. Y., \$13,173.

Berwyn, Ill.—By city, for deep well pump, including foundation, to Wm. H. Cater Contr. Co., 2720 W. Monroe st., Chicago, for 3,520.

Bridgeport, Ill.—By City, for furnishing city with water, to Lawrenceville Light & Water Co.

East Moline, Ill.—For erection of standpipe, to Chicago Bridge & Iron Works, at \$17,000.

Rock Island, Ill.—For erection of proposed filter plant on Arsenal Island, to Pitt Constr. Co., of Pittsburg, Pa., for \$29,000.

St. Charles, Ill.—By Board Local Improvements, for furnishing and laying 1,344 ft. 4-in. and 8,841 ft. 6-in. c. i. pipe from plans of Geo. N. Lamb, St. Charles, to Birdsall-Griffith Constr. Co., of Racine, for \$8,280.

Salem, Ill.—For water improvements, as follows: To Hayton Pump Co., Quincy, Ill., for two centrifugal pumps, \$1,080; to W. C. Johnson, of Salem, for pump house, \$1,075, and to Hirsch & Micotto, of St. Louis, Mo., for 10 to 4-in. Class BB pipe, \$1.30 to 55 cts. per lin. ft.; specials, 4 cts. per lb., and also for valves and hydrants; lowest bidder for elevated tank, Rock Island Bridge & Iron Works, Rock Island, at \$5,000. W. T. McClenahan is City Engineer.

Hammond, Ind.—By Board of Local Improvements, to W. F. Brunt, city, for construction of water mains.

Cedar Falls, Ia.—For construction of 4,000 ft. of water mains, to Blackhawk Construction Co., Waterloo.

Indianola, Ia.—For reservoir, etc., to Lytton-Reinking Constr. Co., of Des Moines, at following bid: Reinforced concrete, \$9.86 per cu. yd.; excavating, 32 cts. per cu. yd.; 10-in. pipe, flanged, c. i., \$1.81; 8-in. BB. & S. c. i. pipe, \$1.25; total, \$13,039. Engineer, A. H. Gilliland, of Indianola.

Lyndon, Kan.—For constructing water works and sanitary sewers from plans of J. W. Mavity, of Lyndon, to Commercial Constr. Co., of Kansas City, Mo.; tower and tank was let to the Memphis Steel Constr. Co., of Memphis, Tenn.; filtration equipment to the Pittsburgh Filtration Co., Pittsburgh, Pa.; hydrants, valves and pumps, to the English Tool & Supply Co., of Kansas City, Mo.; total cost of water works is \$27,471, and sewers \$9,743.

Keewatin, Minn.—By Village Council, to J. S. Lofberg Co., at \$1,821.51, for construction of 80,000-gal. concrete water reservoir.

St. Louis, Mo.—For furnishing and delivering at city pipe yard about 7,718 tons coated water pipe, to U. S. Pipe & Foundry Co., 520 Security Bldg., St. Louis, for \$191,095.

South Amboy, N. J.—By city, for water tank, to Tippet & Wood, of Phillipsburg, for \$5,296.

Cincinnati, O.—For pipe for lines to be laid in Glenway ave., Bridgetown pike and Ferguson rd., to U. S. Cast Iron Pipe & Foundry Co., for \$17,601.

LIGHTING AND POWER

Jonesboro, Ark.—Jonesboro is preparing to pave "Great White Way."

Abingdon, Ill.—City is considering construction of electric system for lighting streets. A. N. Cochran, City Clerk.

Dixon, Ill.—Proposition for 50-year

franchise for gas and electric light carried by majority of over 900.

Coatsville, Ind.—Cyrus Hancock and Wilbur Feighner, Marion electricians, have secured contract for placing electric wiring throughout little city of Coatsville, near Greencastle.

Ida Grove, Ia.—Electroliers will be installed at cost of \$3,000 on five blocks of Main st.

Pilot Mound, Ia.—Ten-year franchise is asked for by Boone Electric Co.

Fort Scott, Kan.—F. C. Louderback and F. D. Martin have presented petition to City Council that provides for establishment of mutual electric plant, with option to city in six, 10, or 12 years.

Mt. Sterling, Ky.—At special session of City Council franchise for term of 20 years for light and water was sold for \$100 each to Water, Light & Ice Co., of this city.

Beverly, Mass.—Sum of \$15,015 has been appropriated for giving city "White Way."

Lowell, Mass.—George H. Brown, Commissioner of Streets and Highways, will present his recommendations for White Way between city hall and Middlesex st. station, to Municipal Council.

St. Cloud, Minn.—City Engineer has been instructed to prepare estimates for installation of cluster lights on St. Germain st. and Fifth ave.

Lockport, N. Y.—Common Council is considering installation of modern system of lights in Main st.

Salem, O.—Specifications have been adopted by Council for new lighting system, and ordinance has been passed authorizing Director of Public Service to advertise for bids for construction of it. Specifications and plans had been changed so as to come within \$20,000 which city had wherewith to build, and are similar to those given recently.

Sharon, Pa.—Citizens have voted in favor of \$85,000 bond issue for purpose of building municipal electric light plant.

Barnwell, S. C.—Bond issue of \$22,000 has been voted for installing light and water plant.

Johnson City, Tenn.—At meeting of City Council B. F. Brook-Sewell, presented proposition to establish a \$100,000 gas plant in this city. If city will grant 30-year franchise work of installing plant will begin.

Dallas, Tex.—Ornamental Lighting Committee of Dallas Chamber of Commerce has decided to close up all contracts at once on ornamental lights for Main and Commerce sts., from Central Railroad to Houston st. and on Houston st., from Elm st. to viaduct.

San Antonio, Tex.—When new city budget is submitted to Council early in June it probably will provide estimate of \$38,400 for street lighting purposes. This, if accepted by Council, will give San Antonio 600 lights.

Murray, Utah.—Municipal power plant to cost \$40,000 to \$50,000 is being discussed and election will probably be held July 1 for voting on same.

Milwaukee, Wis.—Sixty-three bronze standards with arcs will be installed at cost of \$20,000 on new Grand ave. viaduct, if plans approved at recent meeting of Milwaukee Art Commission are passed by County Board of Supervisors.

Oshkosh, Wis.—Installation of system of Corinthian electric lights on Main st. is being considered.

Saskatoon, Sask., Can.—Estimated cost of power and light plant for city is \$2,200,000.

CONTRACTS AWARDED

Fowler, Kan.—To Tonkawa Construction Co., of Tonkawa, for constructing water works and electric light plant.

Hagerstown, Md.—By Street Commissioners, to Westinghouse Electric Co. contract to install additional machinery in municipal electric plant for about \$31,335.

FIRE EQUIPMENT

Maricopa, Cal.—Purchase of new hose has been authorized.

Santa Clara, Cal.—It has been voted to purchase combination motor-driven chemical and fire hose wagon to cost about \$5,500.

Coeur D'Alene, Idaho—People will shortly vote on bond issue of \$15,000 with which to purchase additional fire equipment.

Monmouth, Ill.—Purchase of 200 ft. of 2½-in. hose for Fire Department has been authorized.

Sterling, Ill.—Purchase of auto fire truck is being considered.

Des Moines, Ia.—Immediate necessity

of purchasing motor-driven truck for Fire Department is being urged upon Council.

Dubuque, Ia.—Purchase of automobile fire truck is urged.

Augusta, Me.—Purchase of 1,000 ft. of fire hose has been authorized.

Athol, Mass.—Purchase of motor combination hose and chemical car is recommended.

Gardner, Mass.—New apparatus will probably be purchased for fire Department.

Greenfield, Mass.—Purchase of 1,000 ft. of fire hose is contemplated.

New Bedford, Mass.—Fire Chief Dahill recommends purchase of new motor truck; estimated cost, \$8,000 to \$10,000.

Newburyport, Mass.—Purchase of motor apparatus is being discussed.

Winchester, Mass.—Purchase of auto fire apparatus is being considered.

Calumet, Mich.—Fire Department is considering purchase of new fire apparatus.

Buhl, Minn.—Fire alarm system will be installed.

Anaconda, Mont.—Purchase of motor combination hose and chemical car, aerial truck, 1,000 ft. of hose, steam fire engine and automobile for Chief is recommended.

Grand Island, Neb.—Bids will be received by City Clerk for fire truck.

Gloucester, N. J.—City Board of Fire Commissioners are considering purchase of new fire hose.

Amsterdam, N. Y.—Clerk has been instructed to advertise for bids for auto truck for Fire Department.

Geneva, N. Y.—Common Council has voted to loan to Hydrant Hose Company \$10,000, with which company proposes to erect their new home.

Canton, O.—Purchase of auto aerial fire truck is being discussed.

Price Hill, O.—Purchase of auto combination and hose wagon for Second ave. has been authorized.

Springfield, O.—Purchase of additional fire equipment is recommended.

Burlington, Pa.—About 1,200 ft. of fire hose will be purchased.

Corry, Pa.—Appropriation with which to purchase motor fire truck is recommended.

Dunmore, Pa.—Council will purchase auto fire truck for use of Neptune Hose Co. Machine is to be combination with 35 gal. chemical tank and capable of carrying 1,000 ft. of hose.

Erie, Pa.—Appropriation of \$3,500 has been made for equipment for Engine Company No. 7.

Bristol, R. I.—City will consider purchase of more fire hose.

CONTRACTS AWARDED

San Jose, Cal.—Bids for two motor-propelled combination chemical engines have been received as follows: Webb Co., \$10,575 and \$10,750 each; American-La France Co., \$6,000 each; White Co. (two), \$13,000; Seagrave Co. (two), \$11,900; Reliance Co. (two), \$13,000. All bids were rejected and clerk was directed to readvertise for bids.

Bridgeport, Conn.—By Board of Contract and Supply, for construction of new No. 10 engine house on Putnam st., to J. W. Davis, for sum of \$15,230. Original bid was \$16,845 but \$1,615 was deducted by decision of Fire Commissioners to omit fireproofing of second story. Next lowest bidder was Dowling & Bottomley, with \$15,543.

New Castle, Ind.—By City Council, for 2,000 ft. of fire hose, to Boston Woven Hose & Rubber Co.

Lynn, Mass.—By Municipal Council, for construction of two-way brick fire station at Hollingsworth st., to William W. Brooks, at \$10,990.

Northampton, Mass.—By Fire Department Engineers and City Committee, to New Jersey Car Spring Rubber Co., for 500 ft. of hose at 64 cts. a ft., and to Combination Ladder Co., of Providence, for 550 ft. of hose at 60 cts. a ft. Other bidders were: Revere Rubber Co., of Holyoke; Boston Belting Co., C. C. Co., Canton Junction, Mass.; Eureka Co., of Boston, and Callahan Co., of Boston.

Rochester, N. Y.—For fire house construction, by Board of Contract and Supply, for quarters of truck company in Parsells ave., next to quarters of Engine Co. 9, to Fred Gleason, for \$16,271.

Marietta, O.—By city, to Robinson Fire Apparatus Mfg. Co., of St. Louis, Mo., for furnishing auto fire truck, at \$8,000.

Chambersburg, Pa.—To Eureka Fire Hose Mfg. Co., for furnishing 1,000 ft. of fire hose.

BRIDGES

Los Angeles, Cal.—Provision has been made by Board of Supervisors to go

ahead with balance of work to be done in San Antonio protection district by agreeing that county shall stand expense of building new bridge across Rio Hondo at what is known as Workman bridge.

Los Angeles, Cal.—Monumental bridge across San Francisco Bay to connect Oakland and San Francisco will be built if plans of Allan C. Rush, a Los Angeles engineer are carried out. Cost of structure is estimated at \$26,000,000.

Nashville, Ga.—County Commissioners estimate that cost to rebuild bridges which were washed away by recent heavy rains will be \$10,000.

Monticello, Miss.—Board of Supervisors has passed ordinance providing for advertising in June, sale of bond issue to amount of \$125,000 to be known as bridge and court house bonds, \$50,000 is to be issued for erection of steel bridges and \$75,000 for erection of new court house.

Atlantic City, N. J.—City Council has received request from County Board of Freeholders to hold conference on June 12 relative to building of a new bridge over Thoroughfare at Albany ave.

CONTRACTS AWARDED

Montalvo, Cal.—For construction of bridge near here, to Midland Bridge Co., Gibraltar Bldg., Kansas City, Mo., at \$21,971. Other bids were: Pittman Stone Construction Co., \$22,975; Missouri Valley Bridge & Iron Co., \$23,642; Merceureau Bridge & Construction Co., \$24,480; Edgar T. Wheeler, \$24,900; Mesmer & Rice, \$28,000; Mervy Elwell, \$29,840.

Frankfort, Ill.—To Julius Pfaff & Sons, at \$1,800, for construction of two reinforced concrete bridges in Green Garden.

Taylorville, Ill.—By County and Highway Commissioners of Taylor, Buckhart and South Fork Townships, to Frank Miller, of Springfield, Ill., for building bridge over south fork of Sangamon River, span 140 ft., on tubes 42 in., resting on 6x6 ft., 8 ft. deep, concrete bases, at \$3,100. J. S. Michels, C. E.

Marion, Ind.—By Board of County Commissioners, of Grant County, for two bridges. One will be built at Tilliston

ave., Marion, over White River, to Moore & Cline, at \$6,875, and other over Bell Creek, to W. A. Sunderland, at \$2,475.

Grundy Center, Ia.—To Clinton Bridge & Iron Works, Clinton, for construction of steel bridge in Grundy Co. Contract was awarded at \$3,500.

St. Louis, Mo.—By Board of Public Improvements, for constructing roadway and foundations for Kingshighway viaduct, from Manchester to McRee ave., to Henry F. Heman, Chemical Bldg., at \$25,890.

Monroe, Neb.—By Board of Commissioners of Platte County, Columbus, Neb., to Omaha Structural Steel Works, Omaha, at \$31,500, for construction of bridge across Loup River, about half a mile south of town of Monroe.

Paterson, N. J.—By Freeholders, for completing Rutherford ave. bridge, to F. R. Long & W. G. Broadhurst, whose bid \$52,248, was lowest received.

Rahway, N. J.—To Arthur E. Smith, of Plainfield, by Bridge Committee of Board of Freeholders, for erection of new bridge over Rahway River at Rahway. His bid of \$12,745 was lowest of eight submitted. The new structure will be of two 60-ft. spans of steel girders with concrete driveway, abutments and center pier. Concrete driveway is to be covered with either amiesite or asphalt. Bids received, names and amounts are as follows: John W. Heller, Newark, \$16,865; Dover Boiler Works, Dover, \$17,780; Oswego Bridge Co., Philadelphia, \$13,225; T. Foster Callahan, Elizabeth, \$14,444; W. R. Ransom, Rahway, \$17,785; Ferro Concrete Co., Harrisburg, \$12,875; Stillman, Delehanty, Ferris Co., New York, \$13,500.

MISCELLANEOUS

Phoenix, Ariz.—Ordinance providing for municipal market conducted by city has been submitted to City Council.

Los Angeles, Cal.—Request of Park Commission that City Council raise \$1,000,000 for park development, has been referred to Budget Committee.

Oakland, Cal.—City Council has in-

structed City Attorney to prepare ordinance for \$5,000 appropriation for purchase of new power-driven patrol wagon and ambulance.

CONTRACTS AWARDED

Wilmington, Del.—Following its policy of economy in rescinding garbage contracts, awarded by old Board of Health, a Democratic body, to high bidders, newly elected Board of Health awarded new contracts for collection and removal of garbage throughout city for three years at saving of more than \$15,000. Contracts awarded were as follows: John W. Thompson, First district, \$5,740.40; John W. Woodlen, Second District, \$11,600; Lellion Collins, Third district, \$11,500; John W. Thompson and Charles H. Colburn, Fourth District, \$22,438. The retiring Board awarded contracts as follows: Wm. J. Winchester, First District, \$6,480; Martin F. Keogh, Second District, \$16,400; James C. Lebane, Third District, \$15,500; Daniel McCormick, Fourth District, \$28,080. Several bids specified style of carts to be used, but this was considered unnecessary. Bids received were then read, as follows: First District, John W. Thompson, \$5,740.40; Lellion Collins, \$6,350; Edward Congo, \$6,250; Second District, John H. Woodlen, \$11,600; Lellion Collins, \$12,050; A. G. B. Anderson, \$11,700; W. W. Jackson, \$16,000; William J. Winchester, \$12,000; Third District, Chas. H. Colburn, \$12,687; Lellion Collins, \$11,500; Fourth District, Charles H. Colburn and John W. Thompson, jointly, \$22,438; William J. Winchester, \$27,900.

New York City, N. Y.—By Board of Estimate, for installing elevators in new Municipal Building, to Robert Wetherill & Co., at \$465,400.

New York City, N. Y.—By Public Service Commission, for construction of Section 14 of Lexington ave. subway, extending under Harlem River, from 129th st. to 135th st., to Arthur McMullen, lowest bidder, for \$3,889,775. This contract is for what is known as type K, which provides for four steel tubes incased in concrete.

TOO LATE FOR CLASSIFICATION

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK.	ADDRESS INQUIRIES TO
STREET IMPROVEMENTS.				
Pennsylvania..	Hazleton.....	May 31, 4 p.m....	Pavg. with vitrified brick or other material.....	B. E. Youngman, City Engr.
Pennsylvania..	Altoona.....	May 31, 3 p.m....	Constrn. curb and sidewalk.....	W. M. C. Crane, Pres. Bd. Pub. Wks.
New Jersey....	Jersey City.....	June 3, 2 p.m....	Imp. Lake street; also paving intersection with wood.....	E. B. See, Clk. Comm.
Rhode Island..	Providence.....	June 3, 2.15 p.m....	Furn. 425,000 granite blocks.....	Henry Fletcher, Mayor.
New Jersey....	Newark.....	June 3, 3 p.m....	Furn. and delivering broken stone.....	Freeholders.
Mississippi....	Jackson.....	June 4.....	Pavg. with brick, asph., concrete or other material.....	J. E. McLeod, St. Comm.
Florida.....	Tampa.....	June 4, 2 p.m....	Constrn. 8,700 yds. asph. block paving with granite curb....	D. B. McKay, Chm. Bd. Pub. Wks.
New Jersey....	Jersey City.....	June 5, 10.30 a.m....	Imp. 5 streets.....	E. B. See, Clk. Comm.
Maryland.....	Baltimore.....	June 5, 11 a.m....	Constrn. brick pavement.....	R. K. Compston, Chm. Pavg. Comm.
Virginia.....	Suffolk.....	June 5, noon.....	Constrn. 5,000 yds. vit. brick pav't.....	J. W. Hosier, Chm. Comm.
Kentucky.....	Louisville.....	June 5, 2 p.m....	Imp. sidewalks.....	J. D. Wakefield, Chm. Bd. Pb. Wks.
Kentucky.....	Louisville.....	June 6, 2 p.m....	Imp. sidewalks.....	J. D. Wakefield, Chm. Bd. Pb. Wks.
Montana.....	Miles City.....	June 10.....	Furn. 7,000 vit. paving bricks.....	J. E. Farnum, City Clk.
Washington....	Tacoma.....	June 13, 11 a.m....	Constrn. asphalt, brick or granitoid pav't.....	County Comm.
Alabama.....	Lafayette.....	June 17.....	Constrn. 5 miles sand clay road.....	W. S. Keller, State Highway Engr.
Alabama.....	Opelika.....	June 18.....	Constrn. 6 miles top soil road.....	W. S. Keller, State Highway Engr.
SEWERAGE				
Pennsylvania..	Hazleton.....	May 31, 4 p.m....	Constrn. 800 ft. sewer and appurt.....	B. E. Youngman, City Engr.
Rhode Island..	Providence.....	June 3, 2.15 p.m....	Constrn. sewers in several streets.....	Henry Fletcher, Mayor.
New Jersey....	Paterson.....	June 4, 4 p.m....	Constrn. 16,000 ft. sewers.....	Board Public Works.
New Jersey....	Summit.....	June 4, 8 p.m....	Constrn. 720 ft. 8-in. clay pipe sewer.....	J. S. Stiger, City Engr.
Indiana.....	Indianapolis.....	June 10, 10 a.m....	Constrn. sewage disposal plant for hospital.....	W. T. Patten, County Aud.
Illinois.....	Chicago.....	June 13, noon.....	Excav. harbor and rip-rapping channel.....	Sanitary Dist. Comrs.
Alabama.....	Opelousas.....	June 25, 10 a.m....	Constrn. 10 miles 6 to 18-in. pipe sewers & disposal plant.	W. G. Kirkpatrick, Engr., Birmingham, Ala.
WATER SUPPLY				
Pennsylvania..	Philadelphia....	June 1, noon.....	Furn. and laying 2-in. pipe, hydrants, etc.....	Valley Forge Park Comm.
LIGHTING AND POWER				
Illinois.....	Altamont.....	June 5, 7 p.m....	Install. two 150-h.p. boilers.....	City Clerk.
New York....	Hudson.....	June 20, 8.30 p.m..	Light. streets for 5 years.....	Lighting Comm.
FIRE EQUIPMENT				
New York....	Poughkeepsie...	June 3, 3 p.m....	Furn. 1,600 ft. fire hose and bldg. hose drying building...	J. J. Graham, City Chamberlain.
New York....	Niagara Falls...	June 4, 7.30 p.m....	Bldg. 2 fire halls & install. alarm telegraph system.....	Fire Commissioners.
MISCELLANEOUS				
Pennsylvania..	Hazleton.....	May 31, 4 p.m....	Install. police call system.....	S. J. Hughes, City Clk.
Pennsylvania..	No. Bethlehem...	June 3, 8 p.m....	Alter. municipal building.....	J. McCarty, Chm. Comm.
New York....	Rochester.....	June 3, 2 p.m....	Furn. calculating machine.....	Comm. Buildings.
New York....	Schenectady....	June 4, 1 p.m....	Completing new jail.....	Building Comm.
New Jersey....	Newark.....	June 6, 3.30 p.m....	Furn. automobile runabout.....	M. R. Sherrard, Chief Engr.

STREET IMPROVEMENTS

Washington, D. C.—An American consul in Far East reports that municipality in his district contemplates purchase of number of various sized steam road rollers, and manufacturers are requested to send descriptive catalogues to municipality so as not to be there later than June 15. At same time extra copies of catalogues, with prices, discounts, etc., should be sent to consulate submitting report for catalogue library. It is imperative that prices be given. Bureau of Manufactures, No. 8888.

Atlanta, Ga.—Street Committee will re-advertise for bids for paving of Marietta st., from Tabernacle pl. to North ave.

Seymour, Ind.—Local City Council has awarded contracts for brick streets aggregating \$35,000, work to begin at once and completed during coming summer.

Hiawatha, Kan.—The Hiawatha City Council has ordered principal residence streets of town paved.

Hopkinsville, Ky.—A meeting will be held to get information as to cost of laying brick on streets in business section of Hopkinsville. It is expected that about \$15,000 will be spent.

Louisville, Ky.—Board of Public Works will shortly open bids for paving of 16 alleys with vitrified block at estimated cost of \$27,500.

McComb, Miss.—City will let contract shortly for 5,000 feet of concrete sidewalks.

Flemington, N. J.—It is proposed to build macadam road from Flemington to Frenchtown.

Paterson, N. J.—Tarvia B will be used by Board of Public Works to allay dust on macadam streets in city. Amount specified in contracts is for spreading of tarvia B on 50,000 yards.

Albany, N. Y.—State Highway Commission has announced it would award contracts week beginning June 3 for improvement of 173 roads, aggregating 900 miles in length, at estimated cost of \$12,000,000.

Medina, N. Y.—Board of Trustees of Medina has passed resolution calling special election of taxpayers on May 28, for purpose of voting on proposition to bond village for \$15,000 to cover share of village in paving of trunk line State highway.

Niagara Falls, N. Y.—Resolution advertising for bids for paving of Niagara st., from Portage rd. to 24th st., returnable on June 4, has been adopted. Same resolution includes Eighth, 12th and Walnut sts. and several alleyways.

Toledo, O.—Summit st. merchants have appeared before Council Committee on Public Improvement to speak in favor of resolution providing for paving of Summit st., from Cherry to Perry sts., with smooth pavement.

Hillsboro, Ore.—City Council has adopted ordinances ordering Tarnia modern pavement laid on three blocks of Second st., portion to be paved reaching from Base Line st. to Southern Pacific right-of-way, and also upon two blocks of Washington st., being portion extending along Oregon Electric Railway track from Second st. to the P. R. & N. Railway tracks. Ordinances have also been ordered drawn for pavements on other streets.

Bastrop, Tex.—By vote of 272 to 2, the \$80,000 bond issue for good roads has been carried in Precinct 1, comprising Bastrop, Hill's Prairie and Goodman.

Ennis, Tex.—The Palmer Rd. District has voted for a \$75,000 road bond issue.

Palmer, Tex.—Taxpayers have voted in favor of good roads bonds.

San Angelo, Tex.—Petition signed by large number of property owners throughout county has been forwarded to Attorney-General for his opinion as to its validity. It is for purpose of calling election to determine whether or not road and bridge building bonds in sum of \$70,000 shall be issued.

Amelia, Va.—There has been called a meeting of citizens of Amelia County to consider and discuss subject of building permanent roads in this county.

CONTRACTS AWARDED

Bainbridge, Ga.—By Board of Aldermen, to Jemison & Hollawell, Montgomery, Ala., for approximately 22,000 sq. yds. paving, with necessary drainage and granite curb.

Tipton, Ind.—By Tipton County Board of Commissioners, to Cox & Hobbs, at \$4,790, for construction of gravel road.

Covington, Ky.—By Board of Park Commissioners, to Joseph Conley, at \$27,315, for construction of four miles of plain macadam in Devou Park.

Buffalo, N. Y.—By State Highway Department for 18,100 ft. of asphaltic concrete on Route 26, to Chas. T. Eastburn, Yardley, Pa., at \$61,441.46. Other bids received were as follows: Neff & Horn, Slatington, Pa., \$70,684.25; Blaisdell & Sheldon, Punxsutawney, Pa., \$75,539.36; Emery Construction Co., Mt. Jewett, Pa., \$19,825.16; McNeerney Construction Co., Canton, Pa., \$66,753.16; Stucker Bros. Construction Co., Harrisburg, Pa., \$66,952.49; G. Ralph March, Philadelphia, Pa., \$76,882.65. E. M. Bigelow, State Highway Commissioner; L. F. Neefe, Chief Clerk.

Lisbon, O.—By Board of Commissioners of Columbiana County, to William McLane, city, at \$7,254.37, for grading and paving with brick 2,300 ft. of road in Center.

New Philadelphia, O.—By Board of Commissioners of Tuscarawas County, to Springer & Rogers, New Philadelphia, at \$23,307.78, for grading and paving with brick Section No. 2 of Wooster rd., in Dover Township.

Urbana, O.—By Board of Commissioners of Champaign County and Jas. R. Marker, State Highway Commissioner, Columbus, O., to S. Monroe & Sons Co., Portsmouth, O., at \$8,893, for grading and paving Urbana and Paris rds., in Urbana Township.

Wilmington, O.—By Board of Commissioners of Clinton County and Jas. R. Marker, State Highway Commissioner, Columbus, O., to Weldon N. McKay, Bert Bloom and John A. Conner, Wilmington, at \$22,975, for grading and paving the Wilmington-Xenia rd., in Union.

East St. Clair, Pa.—By State Highway Department, for 4,217 ft. Telford macadam, Route 47, to Saupp & Herr Contracting Co., Altoona, Pa., at \$12,852.32. One other bid was that of Buterbaugh & Mack, Windber, Pa., at \$15,287.18. E. M. Bigelow, State Highway Commissioner; L. F. Neefe, Chief Clerk.

Hickory, Pa.—By State Highway Department, for 8,085 ft. brick block, Route 238, to Wm. McIntyre & Sons, Sharon, Pa., at \$28,970.80. Other bids as follows: Blaisdell & Sheldon, Punxsutawney, Pa., \$42,342.10; Findley, Waid & Co., Sharpsville, Pa., \$28,497.90; Tony Morrello, Butler, Pa., \$29,835.25. E. M. Bigelow, State Highway Commissioner; L. F. Neefe, Chief Clerk.

McKeesport, Pa.—By City, for repaving of Fifth st., from Coursin st. to Gas st., to Bowman Bros.

Schuylkill Haven, Pa.—To Coryell Construction Co., Williamsport, Pa., for 2,850 ft. of paving in Dock st.

Susquehanna, Pa.—By State Highway Department, for 20,085 ft. asphaltic concrete, Route 1, to Chas. T. Eastburn, Yardley, Pa., at \$69,434.48. Other bids as follows: Central Construction & Supply Co., Harrisburg, Pa., \$70,710.56; Strucker Bros. Construction Co., Harrisburg, Pa., \$73,756.05. E. M. Bigelow, State Highway Commissioner; L. F. Neefe, Chief Clerk.

Westview, Pa.—By State Highway Department, for 6,494 ft. brick block, Route 246, to M. O. Herron & Co., Pittsburgh, Pa., at \$36,691.27. Other bids as follows: Ridge Bros. Co., Pittsburgh, Pa., \$41,463.95; Samuel Gamble, Carnegie, Pa., \$45,437.49; Duster Contracting Co., Tarentum, Pa., \$44,778.85; Ott Bros. & Co., Pittsburgh, Pa., \$36,862.66. E. M. Bigelow, State Highway Commissioner; L. F. Neefe, Chief Clerk.

Johnson City, Tenn.—By City Council, for paving Unaka ave., to Cleveland-Trinidad Paving Co. Amount of contract is about \$40,000 and length of that part of street to be paved is almost one mile. Asphalt is being used. S. H. Pouder was awarded contract for curbs and guttering.

Gainesville, Tex.—By County Commissioners, for building several miles of good roads in Gainesville precinct, to Fort Worth Building Co.

Moundsville, W. Va.—To Rosser & Maloney, Bellaire, O., at about \$16,000, for paving at Moundsville.

SEWERAGE

Lewistown, Idaho.—City Council will shortly open bids for purchase of issue of \$100,000 sewer bonds.

Baltimore, Md.—Lowest bid received for Sanitary Contract No. 89 in District No. 40-B, was that of M. C. Brooks Co., Clarksburg, W. Va., at \$48,500. Other bids were as follows: Ryan & Reilly, Baltimore, Md., \$50,476.50; Wm. McCarthy & Co., Baltimore, Md., \$53,674; James Perry & Sons, Inc., Baltimore, Md., \$59,660; B. F. Sweeten & Son, Baltimore, Md., \$66,042.50. Calvin W. Hendrix, Chief Engineer of Sewerage Commission.

Altoona, Pa.—At special meeting of Common Council legislation providing for

special election to secure approval of voters on proposition to borrow \$150,000 for construction of sewage disposal plant and for resurfacing, has been passed finally.

Knoxville, Tenn.—Third Creek sewer and Jackson ave. street widening bond ordinance have been passed on third and final reading by City Commission. This means that work will begin upon these improvements as soon as bonds can be sold and contracts let. One provides for \$15,000 for opening Jackson ave. to L. & N. depot. Second ordinance is to issue \$125,000 to build Third Creek sewer, to drain section west of Ninth st. in Tenth Ward.

Nashville, Tenn.—Complete sewer system is to be put in near future. C. H. McGahn, of Valdosta, has been employed to make survey of Nashville and give estimate of cost of putting in system.

Spokane, Wash.—City Council has approved plans and specifications for sewer to cost \$23,600 that will drain the district south of Manito Park and west of Manito blvd.

CONTRACTS AWARDED

South Bend, Ind.—To De Paeppe & Coussins, 502 Russell st., for construction of a trunk sewer in Ford st.; T. H. Webster, 214 E. Bronson st., was awarded contract for sewers, and Henry DeVos, 142 Birdsall st., secured job for sewer in College st.

Newark, N. J.—By Passaic Valley Sewerage Commission for construction of Section 9 of trunk sewer to McCauley, Mantion Co., of Brooklyn, at \$262,530. Section 9 begins at Elwood and Riverside aves. and runs north 4,000 ft.

Kingwood, W. Va.—To H. C. Brooks Construction Co., Clarksburg, W. Va., for construction of approximately 19,000 ft. of sanitary sewer, with appurtenances, at Kingwood.

WATER SUPPLY

Sulphur Springs, Ark.—Construction of water works will be considered.

Los Angeles, Cal.—City Council has instructed Public Service Commission to enter negotiations with San Pedro Water Co. with view to purchasing plant of that company, and supplying San Pedro and Wilmington with adequate supply of domestic water.

Redlands, Cal.—City will vote on \$600,000 bond issue for installing municipal water plant.

San Diego, Cal.—Bonds in sum of \$340,000 have been voted for extension of water system.

Rock Island, Ill.—Extension of water mains at cost of \$9,058 is being considered by Council.

Indianapolis, Ind.—Extension of water mains has been ordered by Board of Public Works.

Beaver City, Neb.—Installation of water works is being considered.

Greensboro, N. C.—Bond issue of \$20,000 for water mains will be voted on.

Granville, O.—Rebuilding old and installing new water system is being discussed.

Furcell, Okla.—Taxpayers have voted \$100,000 for water and light bonds.

Cooper, Tex.—Movement to put in water works system at Cooper has been inaugurated.

CONTRACTS AWARDED

South Bend, Ind.—For furnishing city with 200 tons or more of water pipe, by Board of Works, to J. H. Rice, agent for Lynchburg Foundry Co., of Lynchburg, Va. Prices are: 30- and 24-in. pipe, \$23.50 a ton; 6-, 8- and 10-in. pipe, \$23.75 a ton, and fittings, \$50 a ton.

Mobridge, S. Dak.—For proposed new 100,000-gal. water tank, to Des Moines Bridge & Iron Works Co., at \$2,700.

Norfolk, Va.—To Hays Manufacturing Co., for furnishing supplies to Water Department.

LIGHTING AND POWER

Chestertown, Md.—Town Commissioners are considering purchase of Centreville Light, Heat & Power Co.'s plant.

Furcell, Okla.—Taxpayers have voted \$100,000 for light and water bonds.

FIRE EQUIPMENT

Grass Valley, Cal.—Purchase of auto fire truck is being considered.

Kansas City, Kan.—10,000 ft. of new hose will probably be purchased.

Leavenworth, Kan.—Purchase of combination motor truck and engine is being considered.